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THE OUTLOOK FOR LAND UTILIZATION IN THE UNITED STATES[1]

O. E. BAKER
BUREAU OF AGRICULTURAL ECONOMICS

The outlook for the utilization of agricultural land in the United States is affected primarily by four groups of factors:

I. Extent of the land resources and rate of depletion.
II. Technical progress in utilization of these resources and trends in agricultural production.
III. Population trends, changes in diet, and other factors that affect the consumption of farm products.
IV. Competition by agricultural products from other countries, both in the United States and abroad.

Each of these four groups of factors is worthy of a morning's discussion, and to include all four in a 50-minute talk requires that the statements be brief and broad, and some may seem bold. May I ask you to remember that little supporting evidence can be presented within the time limits.

THE LAND RESOURCES OF THE UNITED STATES AND RATE OF DEPLETION

No nation in the world, except possibly Russia, possesses such extensive land resources as the United States; and in no other nation, except Russia, is there as much potentially arable land yet unused for crops; yet in no other nation, without exception, is depletion of the soil resources taking place so rapidly.

The Margin of Utilization for Crops

There are fully a half billion acres of land in the United States in which the climatic conditions, the lay of the land, and the fer-

[1] Paper read at twenty-first annual meeting of the American Farm Economic Association, Cleveland, Ohio, December, 1930.

tility of the soil are no less suitable for crops than on some land now used for crops. This is more land than is in crops at present, or in pasture or fallow in alternation with crops. In other words, the occupation of the potentially arable area is only half complete. But, of course, the most productive land is already being cropped and that which remains unused is mostly too wet or too dry, too broken, steep, stony or infertile, or involves too heavy cost for clearing or reclamation, to justify putting it into crops at the present level of prices for farm products. However, about half of this potentially arable land, or 300 million acres, probably, is immediately available for the plow. Nearly two-thirds of this plowable land is located in the Great Plains region.

Improvements in agricultural technique, as well as changes in prices of farm products, are constantly shifting the margin of crop production. Owing to the tractor and combine, land is being used now for wheat in Montana and western Kansas which could not have been used profitably a few years ago, despite a price for wheat then twice as high as now. On the other hand, land is being abandoned in the Appalachian Mountain region which it was profitable to clear and cultivate a generation or more ago before the development of modern agricultural machinery. In addition, there is much land from which the forest was cleared or on which the prairie sod was broken 50 to 100 years ago which was good land then, some of it more productive than most arable land in the United States, but which is now being abandoned because erosion has made its use for crops unprofitable, if not impossible.

As a consequence of the changes in price of products, changes in agricultural technique, changes in the soil itself, great problems of land utilization have arisen. There are probably two million or more farmers, located mostly in the rolling or hilly lands of the Appalachian, the Piedmont and the Ozark regions, on the sandy lands of the Lakes States or elsewhere, and on the leached lands of the South, receiving an average income considerably less than that obtained by their brothers or other men of equal ability in the cities. In the past farmers in these regions and elsewhere have had the compensation of greater economic security, but this is being diminished by the increasing proportion of farms mortgaged, the mounting ratio of mortgage debt to farm value, heavier taxation, and the greater frequency of foreclosures or tax sales in recent years. In addition, it is be-

coming evident that the productive power of much farm land in the United States is being rapidly depleted by unwise and wasteful use of the soil, part of which is owing to the fact that this land is all the farmers have to live on—they cannot sell it for enough to buy a better farm elsewhere, and they are too old to obtain jobs in town.

Depletion of the Soil Resources

The data on soil depletion are meager, but the estimates of well-informed persons indicate that during the brief space of 50 to 150 years, varying with the region, since the forest was cleared or the prairie sod plowed for crop production, probably a quarter, possibly a third, of the original soil resources of fully half the arable land of the nation has been lost. Moreover, it appears that the time is rapidly approaching when, owing to soil losses, the cultivation of many farms will be no longer profitable, if indeed possible, and agricultural production will decline in numerous localities.

The loss of soil resources occurs principally in three ways: (1) by removal of crops without restoring the elements of fertility thus removed; (2) by leaching of the soil, particularly the loss of the mineral salts in solution; and (3) by erosion, that is, physical removal of the soil by running water mostly.

Loss by Crop Removal. According to J. G. Lipman, Director of the New Jersey Agricultural Experiment Station, "The cultivated crops in the United States removed in 1927 approximately 32.5 pounds of nitrogen, 12.5 pounds of phosphoric acid, 30.75 pounds of potash and 13 pounds of lime per acre. After due credit is allowed for the nitrogen returned to the land in animal manures, for that fixed by bacteria and that brought down by rain and other atmospheric precipitation, there is still a net loss of 3,000,000 to 4,000,000 tons of nitrogen annually in 300,000,000 acres of arable land."[2] The nitrogen in commercial fertilizer used replaces less than a tenth of this net loss by crop removal alone. Dr. Lipman's figures indicate a net loss through crop removal of nearly 2,000,000 tons of phosphoric acid, of which less than half is returned in fertilizer used; and a net loss of nearly 5,000,000 tons of potash from this cause, of which only one-fifteenth is returned in fertilizer.

Loss by Solution. The loss of the elements of soil fertility by solution or leaching is much more difficult to estimate. How-

[2] Lipman, J. G., in "The Menace of Overproduction," edited by Scoville Hamlin, pages 65-66, John Wiley and Sons, New York, 1930.

ever, analyses of the water of the Mississippi River near New Orleans indicate that 136 million tons of dissolved matter from its drainage area is passing into the Gulf of Mexico annually. The estimated loss for the entire United States is about twice this amount. Most of this matter in solution doubtless comes from cultivated fields. Apparently no analyses are available of the total nitrogen or phosphorus content of these drainage waters, nor of the potassium content separate from the sodium, but it seems probable that the amounts of these elements that flow into the ocean each year in solution are fully half as great as those lost in soil particles in suspension.[3] If this be the case, there are over 250,000 tons of nitrogen, 350,000 tons of phosphoric acid, and 3,500,000 tons of potash lost annually in solution.

Loss by Erosion. The third source of soil depletion, and much the greatest, is by erosion. H. H. Bennett, of the U. S. Bureau of Chemistry and Soils, estimates that the loss of nitrogen by soil erosion is at least 1,500,000 tons, of phosphoric acid over 2,000,000 tons, and of potash over 20,000,000 tons annually, and he says it may be many times, possibly 25 times this amount.[4] Most of this erosion is taking place on the cultivated or fallow land of the middle atlantic, southern, and central states, and on the over-grazed lands of the West.

The losses from all sources, therefore, appear to be at least 5,000,000 tons each year of nitrogen, 3,000,000 tons of phosphoric acid, and 28,000,000 tons of potash. The losses may be many times these amounts. In the course of time this annual loss depletes the supply of these scarcest elements of fertility in the soil. For instance, chemical analyses of soils in southern Wisconsin which had been cropped for 50 years and of adjacent virgin soils of the same type indicate a loss of about one-third of the original nitrogen and one-fourth of the phosphorus.[5]

Important as these losses of the three scarcest elements essential to plant growth may be from the standpoint of the long-time outlook for land utilization and of increasing cost of fertilizers, the significant loss from the standpoint of the immediate future is the loss of the soil itself by erosion. Nitrogen, phosphorus, potassium, and all the other mineral elements of fertility lost from the soil can be replaced by the use of fertilizers, but the humus of the surface soil, the crumb-like structure of this

[3] See Clarke, Frank W., "The Composition of the River and Lake Waters of the United States," U. S. Geological Survey, Professional Paper No. 135.

[4] Bennett, H. H., and Chapline, W. R., "Soil Erosion A National Menace," U. S. Dept. of Agric. Circular No. 33, page 5. Provides data from which calculation was made by writer.

[5] Whitson, A. R., Professor of Soils, University of Wisconsin, in a letter to the writer.

top layer, its water-holding capacity, bacterial content, and all the other factors that make it more fertile than the subsoil, can be replaced only very slowly, indeed practically never can be restored.

Based on soil survey and field studies, Mr. Bennett states that "something like 17,500,000 acres of land that were formerly cultivated in this country have been destroyed by gullying, or so severely washed that farmers cannot afford to attempt their cultivation or reclamation."[6] He adds, "The estimate is considered as a minimum, because all the eroded lands have not yet been surveyed." Gullying, Mr. Bennett explains, is only a late stage of erosion, and usually does not set in severely until the surface soil is gone, and washing develops in the usually heavier subsoil with its lesser humus content.

Including erosion of surface soil, Mr. Bennett has expressed the opinion that two-thirds of the cultivated land in the United States is eroding in some degree and that a fourth to a third is eroding seriously, that is, the surface soil will be gone, unless farm practices are changed, in 35 to 100 years, varying with the character of the soil and other conditions. In other words, within 100 years gullying seems likely to be well advanced on 100,000,000 acres, or one-fourth of the nation's arable land.

In the Upper Coastal Plain of the South, for example, particularly the Susquehanna series of soils, which have a heavy clay subsoil, millions of acres of gullied land have been abandoned and are lying idle or growing up to pine forest. Similarly, in the Piedmont of Georgia, the Carolinas and Virginia, Mr. Bennett states that—"Probably not less than 60 per cent of all the upland . . . has lost from 4 to 18 inches of its soil and subsoil. . . . Many of the gullies have cut down to bed rock."[7] Sheet erosion of the surface soil, however, is not so serious in the Piedmont as elsewhere, because the subsoil is looser and "if properly tilled and fertilized can be profitably cropped." But in the Black Prairie of Texas, the South's greatest cotton producing area, erosion is proceeding more rapidly than in the Piedmont, and the underlying chalk is much less productive. Mr. Bennett states that the dark-colored surface soil of this prairie, which is only 6 to 12 inches deep over the sloping areas, is being eroded, on the average, at the rate of something like 7 inches in 35 to 40

[6] Documentary Material for the Inter-American Conference on Agriculture, Forestry and Animal Husbandry, Washington, D.C., 1930, page 81.

[7] "The Problem of Soil Erosion," address before Association of American Geographers, Worcester, Massachusetts, December, 1930. Probably will be published in Annals of Association of American Geographers for 1930.

years.[8] On some fields the surface soil is already gone and the land is lying idle.

In Oklahoma the Agricultural Experiment Station completed this year a reconnaissance erosion survey. Of the nearly 16 million acres in crops in the State this survey shows that over 13 million acres are suffering from the effects of severe soil washing. Of this eroding area nearly 6 million acres have reached the stage of gullying. Of 1,700,000 acres of crop land abandoned during the last four years, 1,360,000 acres, it is estimated, were abandoned largely because of erosion.[9]

In Kansas, Professor Duley estimates that 75 per cent of the Corn Belt portion of the State is suffering severely from sheet erosion, as is also 40 per cent of the mixed farming land in the southeastern section of the State, 30 per cent of the wheat area of central Kansas, and 10 to 20 per cent of the wheat land of western Kansas.[10]

Quite similar conditions to those of the Corn Belt in Kansas prevail over much of the region of sloping glacial soils in northern Missouri and southern Iowa, that is, in the region of the Shelby soils, according to Mr. Bennett.[11] Here some of the land has lost from one to three feet of soil, and fields that yielded from 40 to 60 bushels of corn per acre in their virgin condition now yield only 20 to 30 bushels.

Even in Illinois, erosion gives promise of causing contraction in the crop area. In a letter from a prominent official of the College of Agriculture it is stated, "Although Illinois is not ordinarily considered as being subject to erosion to the same extent as many other states, erosion is one of the really serious problems facing a large group of farmers. While there are at least 9 million acres of low value land in Illinois subject to serious erosion, more than one-half of which is hardly suitable for cultivated crops, there are more than 14 million acres of high value land in the state subject to serious erosion, which is gradually approaching a stage where gullies are being formed."[12]

Effect of Depletion and Erosion on Land Utilization

The influence of soil depletion and erosion upon the utilization of land in the United States in the near future is difficult to

[8] Ibid.

[9] Winters, N. E., address before Southwestern Conference on Soil and Water Conservation, Stillwater, Oklahoma, June, 1930. Mimeographed by Okla. Agric. Exp. Sta.

[10] Duley, F. L., address before Southwestern Conference on Soil and Water Conservation, Stillwater, Oklahoma, June, 1930.

[11] Bennett, H. H., "The Problem of Soil Erosion," address before Assn. Amer. Geographers, Worcester, Massachusetts, December, 1930.

[12] Mumford, H. W., in a letter to the Secretary of Agriculture.

estimate, but it appears very likely that several million acres of land will go out of use for crops within the next ten years. However, because of advances in agricultural technique and of the large area of untouched land available for crops, these few million acres that may be lost by erosion will have little effect upon the agricultural production of the Nation in the next decade. More important perhaps with reference to present influence is the slow but widespread depletion of soil fertility on land where erosion is less advanced. In view of the advances in plant breeding, the improvements in agronomic technique, and the greater control over plant diseases than in years past, it is difficult to account for the stationary or declining acre-yields of corn, wheat, and oats during the past quarter century in most parts of the United States, except those where fertilizers are being extensively used, other than on the basis of depletion of soil fertility.

Looking beyond the next decade, it seems probable that the effects of soil depletion in its various forms will become increasingly serious, for as farmers' incomes are reduced by declining acre-yields their ability to buy fertilizers or adopt means of retarding erosion will be diminished. Undoubtedly, terracing will do much to retard erosion, and the planting of cover crops in cotton and corn fields, which crops account for fully three-fourths of the erosion losses, would also aid in holding the soil in place. Still more effective would be the use of perennial hay crops, and, most effective of all, would be keeping the land in pasture.

Without minimizing the importance of restoring to forest the hill lands of the East and Southeast that have been cleared for crops by earlier generations, it is evidently more important from the standpoint of conserving the nation's resources to restore to grass and perennial legumes all except the level lands of the West and Southwest. This may be profitable in many cases to the individual farmer, as well as desirable from the standpoint of the nation. In general, milk or meat is produced on pasture at one-half to one-fourth the cost of similar production in stall feeding. However, it is often cheaper to rent more pasture than to apply commercial fertilizer to the pasture one has in the farm. But sometimes it is inconvenient to utilize rentable pasture land, and it is probable that after a few farmers begin to fertilize their pastures, the rental on other pastures in the locality will rise.

Progress in mechanization of agriculture also is likely to im-

prove the utilization of land with reference to erosion. The tractor will tend to stimulate the production of crops at the expense of pasture on the level lands, in order to obtain an adequate acreage for the efficient operation of the machine, and this will make competition in crop production on lands less suitable for use of large scale machinery increasingly difficult. Such lands will tend to be used for pasture.

However, the lowering yields of the crops resulting from soil depletion or removal will tend to raise the cost of production, and the danger is that large areas of eroding lands will not go into pasture, but will go out of use entirely and soon be so severely eroded as to be almost worthless. There is urgent need for research in the control of land erosion and later for appropriate action in restoring to a condition of productivity, which should be permanent, these vast areas of eroding or badly depleted lands. Such action may require the resources of the state to supplement the efforts of individual farmers.

Technical Progress in Land Utilization and Trends in Production

Despite the depletion in land resources, the trend of agricultural production for the nation as a whole has been rapidly upward, the losses in soil fertility having been more than balanced by advances in agricultural technique. As in coal mining, although the resources are less abundant, methods and machinery have improved so rapidly that a troublesome surplus of products has developed, and the less favorably situated or less efficient producers are being forced to the wall. These advances in technique that have followed the application of science to agriculture and associated industries have been myriad in number, but nearly all may be grouped with reference to the increase of production into six classes:

(1) Those that have promoted the expansion of the agricultural area.
(2) Those that have caused increased acre-yields of the crops.
(3) Those that have resulted in increased efficiency in utilization of feed by farm animals.
(4) Those that have substituted mechanical for animal power on farms and thereby conserved feed.
(5) Those that have led to shifts from the less productive toward the more productive crops per acre.
(6) Those that have led to shifts from the less productive

toward the more productive classes of animals per unit of feed consumed.

1. *Expansion of the Agricultural Area.* The agricultural occupation of the world is a relatively recent development. The area brought under the plow during the past century has been as great, probably, as in all the centuries preceding; and during the past 30 years it has been two-thirds as great, apparently, as in the 70 years preceding. Prior to 1850 agriculture had developed mostly in forested regions, where streams or springs were abundant, or in desert areas reclaimed by irrigation. The vast sub-humid and semi-arid grassland areas were the grazing grounds of nomads. Most of the expansion of the crop area during the past 50 to 75 years has occurred on these grassland areas, notably the prairies and plains of North America, the Russian steppes, the Argentine pampas, and the semi-arid lands of Australia. The utilization of such lands for crops was made possible by the invention of well-drilling appliances which provided water for man and beast, by the railroads, which brought wood and coal to the settlers and carried their wheat and meat to market, and by the invention of grain seeding and harvesting machinery which enabled one man to do the work of five, releasing the other four for employment in urban industries. Recently the tractor and the combine have facilitated the further expansion of grain production along the arid margin of these grassland areas. During the past decade the wheat area in our Great Plains States has increased about 8 million acres, and in the prairie provinces of Canada by about 7 million acres.

But in the United States as a whole since the World War there has been practically no increase in the crop area, expansion on the semi-arid lands of the West being balanced by contraction in the humid areas of the South and East. The increase in agricultural production since the War must, therefore, be ascribed to factors other than expansion of the crop area.

2. *Increased Acre-Yields of the Crops.* In parts of the United States, notably in the atlantic states from North Carolina northward, where commercial fertilizers are extensively used, the acre-yields of the crops have been increasing rapidly (Fig. 1). But in most of the northern and western states acre-yields of the crops are more or less stationary, and in the South, where the boll-weevil has extended its depredations to the very edge of the Cotton Belt, acre-yields are lower than before the World War. For the nation as a whole there has been practically no change in

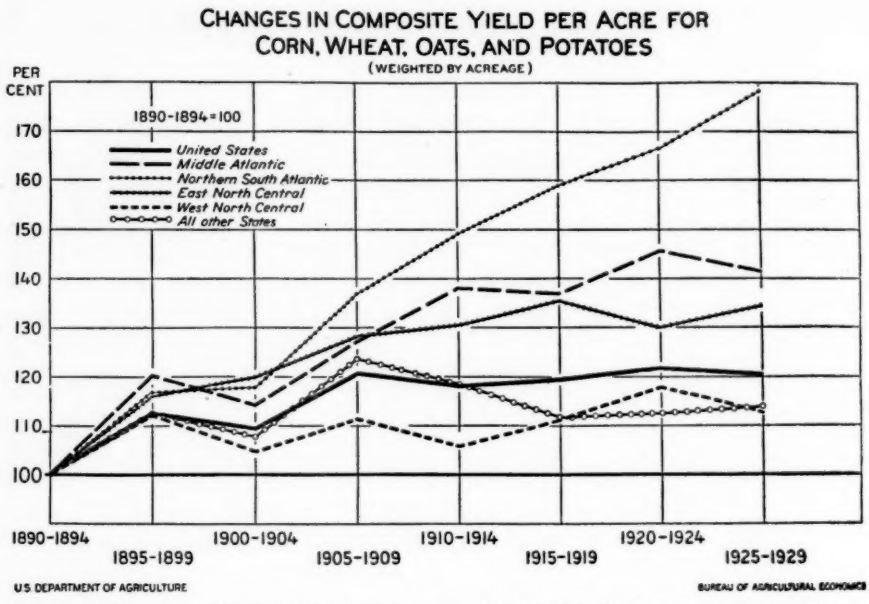

FIG. 1. The composite yield has increased most in the Northern South Atlantic States.

the composite acre-yield of corn, wheat, oats, hay, and cotton since the period 1905-1909.

Evidently factors other than expansion of crop acreage or increased acre-yields of the crops must account for the increase in agricultural production since the World War.

3. *Increased Production of Meat and Milk per Unit of Feed Consumed.* The aggregate production of crop feed available for farm animals has increased very little since the beginning of the World War. It is probable that the total acreage in pasture has declined slightly. Nevertheless, the production of animal products, considered as a whole, has increased apparently nearly a third. (Fig. 2.) This has been made possible by three developments:

1. The feed released by the decline in horses and mules consequent upon the increasing use of the automobile and tractor.
2. The decreasing proportion of the feed consumed by beef cattle and the increasing proportion consumed by dairy cattle, hogs and poultry, which are more efficient in transforming feed into human food.
3. The increasing production of milk and meat per unit of feed consumed, particularly of milk by dairy cows and of

pork and lard by swine. Let us consider this last factor first.[13]

This increasing efficiency of the livestock of the nation in transforming feed into food is, in turn, owing to at least two factors. The first factor is the decreased production of pork in the South and increased production in the North and West, where the animals, in general, are of better stock and more efficient in transforming feed into food. There are only half as many hogs south of the Ohio and Potomac rivers as there were ten years ago. On the other hand, there are

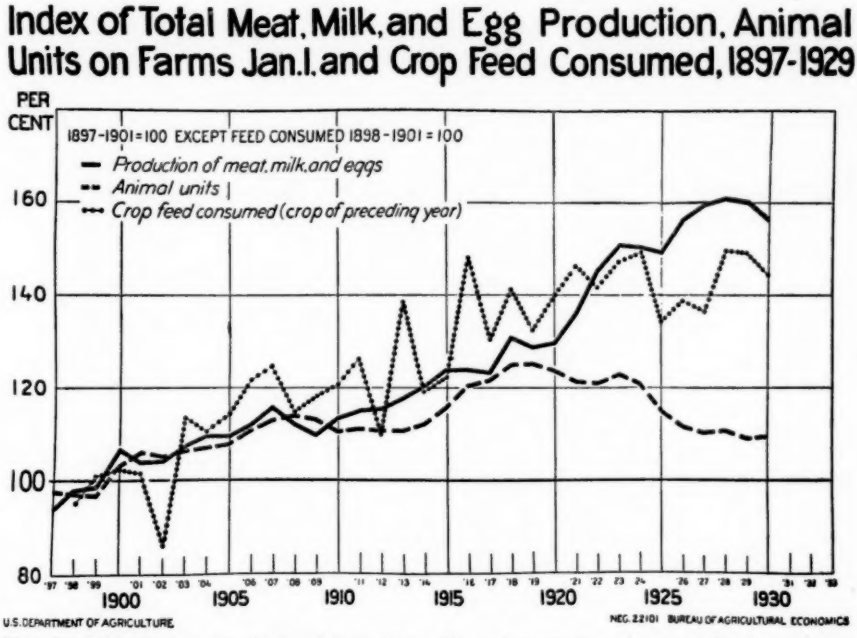

FIG. 2. The production index for meat, milk and eggs has risen, while the number of animal units has fallen.

20 to 100 per cent more hogs in the states from Minnesota and Iowa to Kansas and westward, excluding the Pacific coast. There has been a corresponding shift in corn acreage and the yield per acre of corn is about twice as high in Iowa and Minnesota as in the South. A large increase in production of milk likewise has occurred in the region west of Lake Michigan. Undoubtedly, the feed released by the decline in horses and mules in the North and

[13] The increasing production of meat and milk in relation to feed consumed, and factors affecting the trends, are discussed more fully in a preliminary report (mimeographed) entitled "Regional Changes in Farm Animal Production in Relation to Land Utilization," U. S. Bureau of Agricultural Economics, October, 1929.

West has been an important cause of this increasing concentration of meat and milk production in the west north central states.

A second cause of this increasing production of meat and milk per unit of feed consumed consists of the improvements in farm practice. Cow-testing associations and other agencies have promoted the selection of the larger-producing cows and the slaughter of the poorer cows. The figures indicate little increase in the number of cows during the past decade, but the production of milk has increased, apparently, 25 per cent, possibly 30 per cent. Feed eaten by the cows has increased, apparently, much less rapidly than milk production. Likewise, there are fewer hogs on farms than a decade ago, but the production of pork and lard is estimated to be about 20 per cent greater. Better sanitation has resulted in saving more pigs per litter, with a consequent saving in feed. Also more legumes and minerals are being used and more growth is obtained on the same amount of feed. Beef cattle and sheep are being slaughtered at an earlier age, and young animals make more gain on the same amount of feed than old animals.

The significance of this increasing production of meat and milk per unit of feed consumed, becomes evident when it is realized that about 70 per cent of the crop land and all of the pasture is used to feed farm animals. Over 80 per cent of the sustenance yielded by the soil each year in the United States is eaten by farm animals. It is probable that the increased efficiency of the nation's livestock in transforming feed into food is as important a factor as the tractor and automobile in accounting for the great increase in agricultural production since the War.

4. *Substitution of Gasoline for Horse Feed.* The introduction and increasing use of the automobile and tractor has permitted a reduction in the United States of over 8,000,000 horses and mules since the War, and thereby released about 25,000,000 acres of crops, which are now used mostly to feed meat and milk animals and to grow cotton. As about 200,000,000 acres were used for these purposes in 1919, it appears that this crop land released by the decline in horses and mules has provided an increase of about 12 per cent in the 12 years in the acreage available for the production of meat, milk, and cotton. This is an increase nearly two-thirds as great as the increase in the nation's population.

5. *Shifts from Less Productive toward More Productive Crops Per Acre.* Less important, yet a significant factor, particularly from the standpoint of the crop land requirements of the nation,

has been the shift from the less productive crops per acre to the more productive; particularly, from corn toward cotton in the South, a crop which is worth much more per acre, from wheat toward corn in the North, and from grain and hay toward fruit and vegetables in several areas, notably in California. The acreage of crops having a value of less than $25.00 an acre has remained more or less constant for 15 years, whereas the acreage of crops having a value of over $25.00 an acre has increased over 20 per cent since the World War.

6. *Shifts from Less Productive toward More Productive Animals Per Unit of Feed Consumed.* Likewise, there has been a shift from beef cattle toward dairy cattle, hogs and chickens, which produce much more food than beef cattle per unit of feed consumed. The American people consume about 1,400,000 calories of food per person per year, and to produce this number of calories requires only two and a third acres of grain, hay and silage fed to dairy cows and one and two-thirds acres of pasture, only three acres of corn and other products fed to hogs, but about eleven acres of grain and hay fed to beef cattle, besides several acres of pasture.

Will these Causes of Increased Production Continue?

The two most important of these four factors that have promoted the rapid increase of agricultural production since the War seem likely to persist for several years. There are less than half enough colts being raised to replace the horses and mules that die or become incapacitated yearly, consequently the replacement of horses by tractors appears inevitable for several years at least. Moreover, the use of the combine in association with the tractor seems likely to result in a continued expansion of grain production in the semi-arid areas of the West. The improvements in farm practices, particularly those that have contributed to greater production of meat and milk per unit of feed consumed, probably will continue for many years. In addition, it is becoming evident that even at present prices of farm products, it would pay to use more fertilizer, and if prices of farm products should become higher, the use of fertilizers would be greatly encouraged. The depletion of soil fertility points to a greatly increased use of fertilizers in the future, particularly on the more level and the more fertile soils. Progress in agricultural technique, therefore, seems likely to overbalance the decline in soil resources for at least several decades to come.

But another retarding factor may become important, in addition to soil depletion, namely, labor depletion. Although the present generation of farmers will continue to farm for a much smaller compensation than that received by most other occupational groups, because there is no alternative employment for old farmers and little other for farmers of middle age, the farmer's children are migrating to the cities so rapidly that the total farm population has decreased over ten per cent in the last ten years. It is probable that the average age of the farmers, like that of farm horses, is increasing. Moreover, the rural birth rate, though higher than the urban, is decreasing about as rapidly. If it declines as much in the next 8 years as in the last 8 years, it will be insufficient to maintain a stationary farm population and provide any surplus for the cities. Whether progress in agricultural technique will be able to overbalance this factor also of declining labor supply only the future can reveal.

Some light may be thrown on this question of the balance between technical progress and land and labor depletion in the near future by comparing the trend in agricultural production during the past 30 years with the trends in crop acreage and in quantity of farm labor.

Trend in Agricultural Production in the United States Compared with Crop Acreage and Farm Labor

During the past four years the Division of Land Economics in the Bureau of Agricultural Economics has been working on an index of agricultural production since the beginning of the twentieth century.[14] The work is not yet completed, but is sufficiently complete to show that at no time since 1900, and probably since 1890, did agricultural production increase at so rapid a rate as in the years from 1921 to 1926. This trend in production is compared with the trends in population, total crop acreage, and total agricultural labor in Figure 3. Production, population, land and labor at the beginning of the century are each considered as 100 per cent, and the chart shows the percentage change each year since compared with the base year or years at the beginning of the century.

[14] The various crops and animal products (bushels, bales, pounds, etc.) are totaled on the basis of average farm price during the decade 1917-1926. This normal farm value of the crops during a series of years represents more closely than any other common denominator the aggregate amount of labor, capital, and other factors involved in production; in fact, it is the only common denominator that permits combining foodstuffs with fibers. The index covers consumption also, and it is planned later to total the foodstuffs on the basis of energy value, measured in calories, in order that data may be available on changes in diet measured in this manner.

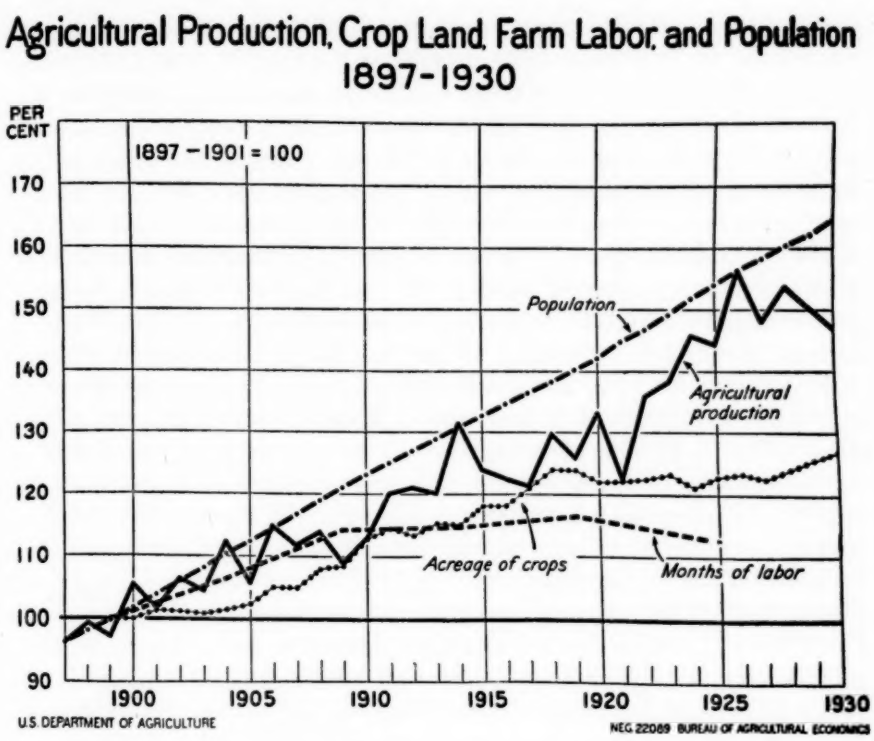

FIG. 3. Agricultural production has increased greatly since 1920 although acreage of crops has remained nearly constant.

Production and Population. First, let us note the relation of agricultural production to population. This relation was opulent at the beginning of the century,—if we may judge by the export surplus of farm products, it was as opulent as at any time previously or since. Prices of farm products also indicate that this base period was one of relative abundance. The average farm price of corn during the 5-year period 1897-1901 averaged 36 cents a bushel, of wheat 64 cents, and of cotton 7 cents a pound.

This high ratio of production to population persisted until 1907, when a slight slump occurred in production, which was not regained in 1908, and was followed by another slump in 1909. Then followed a period of 5 years in which production each year was larger than in the year preceding, except 1913. In 1914 the opulent relation of production to population which existed at the beginning of the century was temporarily restored, owing principally to a very large cotton crop and a large wheat crop. In

1915, 1916, and 1917, war years, production declined again, then increased in 1918 and 1920, reaching a point in this latter year as high is in 1914. But meanwhile the nation's population had increased 10 per cent. The season of 1921 was exceptionally adverse, production being only 23 per cent above that at the beginning of the century while population had become 47 per cent greater. Then followed what was, in some respects, the most remarkable period in the history of American agriculture. For 5 years production each year was greater than in the year preceding, and by 1926 had reached as opulent a relation to population as at the beginning of the century. Between 1921 and 1926 agricultural production increased about 27 per cent, whereas population increased 8 per cent. This increase in production from 1921 to 1926 was owing largely to cotton, meat, and milk.

Since 1926, or since 1928 if cotton be excluded, there has been a period of declining production, like that during the World War years. But this declining production, apparently, is owing mostly to adversities of the weather. In 1927 there was the Mississippi flood, in 1929 the season was wet, and during the past year, 1930, drought of unprecedented duration has covered a large portion of the country. Total crop acreage has been increasing slowly since 1924, and the agricultural surplus, apparently, would have been greater since 1926, instead of smaller, had not these adversities of the weather intervened.

The small corn crop of 1930 may result in a low production of meat in 1931, and bring the index of agricultural production for 1931 below that for 1930. There will then have been five years of downward trend in production, a period about as long as that which followed the preceding peak in 1914. This difference exists, however, that the present period of decline is owing in part to an extraordinary series of bad seasons, whereas the former period was attributable largely to war conditions.

Production and Crop Area. The total acreage of crops harvested has remained more steady than agricultural production, principally because it is much less affected by weather conditions. But comparison of the curves of production and acreage indicate that during the past 30 years three cycles, if such they prove to be, have occurred in the relationship between crop acreage and agricultural production each cycle being characterized by a rising and then a declining production per acre. During the last cycle, however, which may best be dated from 1917, particularly if cotton be excluded from the production index (it was the principal

cause of the drop in 1921), production rose much higher above acreage than in the previous cycles or periods.

This great disparity between crop acreage and total agricultural production during the past decade, amounting to about 22 per cent as compared with the relationship at the beginning of the century, undoubtedly is owing principally to the land released by the decline in horses and mules, to increasing production of meat and milk per unit of feed consumed, and to shifts toward the more productive crops and farm animals previously noted. Since replacement of horses and mules by tractors must continue, owing to few colts being raised, and since improvement in production of milk, probably also of meat, per unit of feed consumed is likely to persist, it seems almost certain that during the next cycle the disparity between production and acreage will be greater than during the present cycle, which seems to be approaching a close. But whether the increase in production will be sufficient for the needs of the increasing population without an increase in crop acreage is doubtful. Total crop acreage in the United States as a whole has remained almost stationary since 1918, but with a slight tendency upward since 1924. Unless more wheat land is devoted to other crops, and perhaps a little cotton land also, with a probable consequent decline in exports of these commodities, or unless there is a series of very favorable seasons, it looks as though some expansion in crop acreage will occur during the next decade. This increase in acreage is more likely to occur in the latter years of the cycle (if there be a cycle), when production is declining. It should be recalled, however, that in 1925 there were about 25 million acres of plow land lying idle, and 113 million acres of plowable pasture in farms. There is a large opportunity for expansion of crop acreage, therefore, within the present farm area.

Production and Human Labor. The quantity of labor employed in agriculture increased between 1899 and 1909 approximately as fast as production; but between 1909 and 1919 there was very little increase in agricultural labor, and since 1919 the census figures indicate a decrease.[15] Comparing the 10 to 15 per cent increase in farm labor since the beginning of the century with the 50 per cent increase in farm production, there is indi-

[15] The estimates of agricultural labor, unlike the estimates of production and crop area, are based on the census, and, therefore, are available only for the years 1899, 1909, 1919, and 1924. They consist of the number of farmers multiplied by 12, assuming that farmers work all the months in the year, plus the expenditure for labor divided by the average monthly wage, by states. The estimates are not complete, because family labor is not included; but it is believed the figures are approximately comparable between the four years, and, therefore, suffice as a basis for index numbers. The 1930 census data are not yet available.

cated an increase of about 30 per cent in production per man-month. All of this increase has taken place, apparently, since 1909, and most of it since 1919. In view of the rapid progress in the mechanization of agriculture, it seems unlikely that there will be an appreciable increase in the quantity of labor employed in agriculture during the next decade at least, and the present downward trend may continue. Such a diminution in the supply of labor probably will not materially affect the trend of production during the next decade.

The Prospect for Domestic Consumption of Farm Products and for Exports

The consumption of farm products in the United States depends, obviously, upon two factors, the number of people and their consumption per person.

The Population Prospect

The increase of population in the United States during the century and a half since the founding of the Republic has been extraordinary and remarkably steady. From a little over three million the population has increased to about 123 million, and the almost straight line in Figure 3 indicates how steady the increase has been during the past thirty years. Agricultural production has increased accordingly. The farmers of the nation have provided not only food and fibers for domestic needs, but also have produced a surplus for export which was nearly as great, measured in acreage required to produce it, during the decade after the World War as in any previous decade in the nation's history. Expansion, in other words, has been the outstanding characteristic of American agriculture.

The recent rapid decline in the birth rate indicates that this splendid epoch is drawing to a close, and that a quarter century hence, unless the birth rate rises, or the immigration laws are made less restrictive, or unless more meat is eaten per person, or larger markets are found abroad, the farmers of the nation will face a stationary demand for their products, and may thereafter experience even a decreasing demand.

There were about 80,000 fewer children born in the United States in 1929 than in 1928, about 60,000 less in 1928 than in 1927. The birth rate has fallen from 24.3 in 1921 to 18.9 last year. If this decline continues for four years more the number of births will be sufficient to maintain permanently only the present popu-

lation of the United States, whereas the nation will have by 1960 certainly 150 million people and possibly 160 million. This continued increase in population is owing to the large number of young people resulting from higher birth rates in the past, few of whom will die in the next 30 or 40 years. The prospect is for a declining population after 1970, unless the immigration laws are modified.

The decline in the birth rate is confirmed by the enrollment in the lower grades of the public schools. The number of children in the first grade has been declining irregularly since 1918, in the second grade since 1922 and in the third grade since 1924. The more rapid decline in the birth rate during the last five years, obviously, is not yet reflected in the school enrollment figures. The decline in the birth rate is further confirmed by the figures for a few states on age of the population now available from the 1930 census. The proportion of the population under 5 years of age is much smaller than in 1920, and in some states, despite the greater population, there are less children of this age now than then.

The reduction in European immigration, which was composed mostly of young married or marriageable people, and the subsequent accelerated migration of young people from the farms, where the birth rate is high, to the cities, where it is low, have been important factors in diminishing the birth rate. These factors seem likely to persist, and, in addition, it appears likely that so long as it costs over $8,000 to raise a child to the age of 18 for a city family having an annual income of $2,500, according to estimates made by the Metropolitan Life Insurance Company, there is little prospect of a rising birth rate in the cities.

The prospect for a notable increase in immigration is less promising than in the past, not only because of the attitude of the American people, but also because the birth rate in the countries of northwestern Europe, from which region most of our immigrants are now coming, is declining more rapidly than in the United States. The birth rate in England, Germany, and Sweden is now lower than in France, where population has been practically stationary for a half-century. In twenty to thirty years it appears very likely that there will be a stationary or declining population in nearly all the countries of northwestern Europe.

The declining birth rate in the United States will effect the total population only slowly. In 1940 there will probably be 12 to 15

million more people than at present, and between 1940 and 1950 10 to 12 millions may be added. The agricultural effect of the declining birth rate, therefore, will scarcely be felt during the next decade, and only slightly in the decade following. But the decline is of great significance from the standpoint of a national land policy, particularly with reference to the question whether much of the present marginal land will be needed in the future for crop production, or can be converted into forests or pastures.

Consumption of Foods and Fibres per Person

The World War caused changes in the diet of the American people as it did in many other things. The principal change in diet was a notable decline in the use of the cereals and an increase in the consumption of sugar, milk, pork and probably, of fresh vegetables. Apparently the higher wages and salaries of city people after the War enabled them to eat more of the expensive foods, sugar being an exception. (Fig. 4.)

The average consumption of wheat flour per person, for instance, was about 211 pounds in the pre-war period 1909-1913, but after the United States entered the World War there was an abrupt drop to 176 pounds (in 1917-1918), which is 17 per cent decrease, and consumption has remained almost stationary

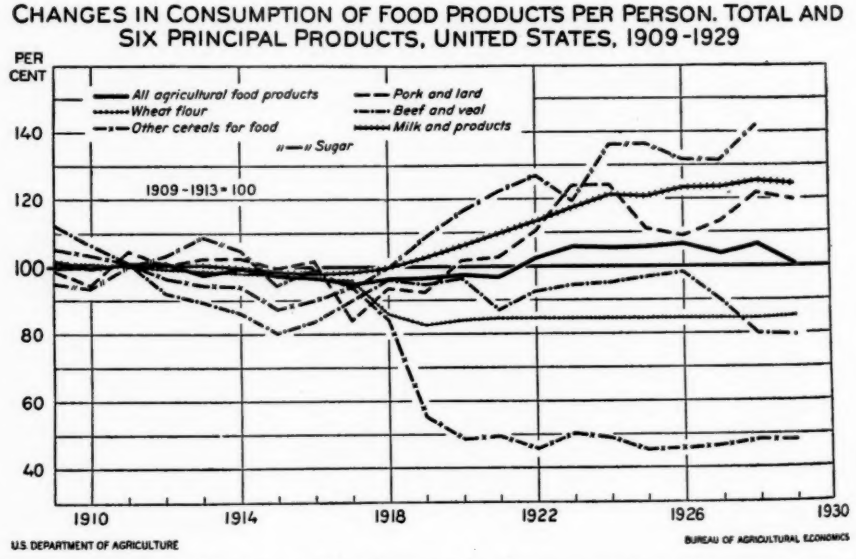

FIG. 4. There has been a striking increase in the consumption of sugar, whereas the consumption of wheat flour and other cereals for food has declined.

at this point since. The use of corn for human food declined much more, doubtless owing largely to the rising standards of living during and after the War and increasing use of wheat flour and other foods by both negroes and whites in the South, where corn had been used for human food more extensively than elsewhere, and to the increasing proportion of the people who live in cities, where little corn bread is baked in homes and even less by bakers. The decline in use of rye flour has been about as great proportionately as of corn meal.

The total consumption per person of wheat, corn, oats, rye, buckwheat, and barley for human food averaged about 340 pounds a year during the pre-war period 1909-1913, whereas during the last five years it has been only about 240 pounds. This is a decrease of 100 pounds, or nearly 30 per cent. On the other hand, the average American is now eating about 30 pounds more sugar, or over a third more than before the War, probably a fourth more milk and dairy products, possibly a tenth more vegetables, and, until recently, a little more meat.

The total consumption of meat per person, excluding poultry, but including lard, was about 154 pounds during the pre-war period, and is now about the same. During the period 1923 to 1926 the consumption averaged 161 pounds. The significant change has been the increased per capita consumption of pork (about 15 per cent) and decreased consumption of beef in recent years.

The Effect of the Change in Diet on the Need for Land

These changes in diet have had a marked effect upon the need for farm land since the War period, but compared with the pre-war years the change is slight. If a man could live on sugar alone it would require only about one-third of an acre of sugar beets (at average acre-yields in United States), or cane (average acre-yields in Louisiana) to provide the same amount of energy as that in the food the average adult American consumes each year, but it would require three-fourths of an acre of corn or potatoes, an acre and a half of wheat or tomatoes, over three acres if he ate only pork and lard, about two and a third acres of crops and one and two-thirds acres of pasture if he lived on milk, and 11 acres of crops plus two and and a half acres of pasture equivalent if he lived wholly on beef and veal.

Of course, no man could live on sugar alone, for in a few weeks he would develop diabetes and other diseases, probably he

could not live for a year on wheat alone, but he might be able to do so on milk, which is the most complete food. This comparison of acreage required to produce an equal quantity of food, measured in calories, shows that much more land is required to produce a diet based largely on meat than one based on wheat, corn, or the other cereals. It now requires over two acres of crops to feed the average American, but only one acre to feed the average German, one-half acre to feed a Chinese, and one-fourth an acre, a Japanese. This is owing largely to the difference in diet, except that the difference between China and Japan is owing to much higher crop yields in Japan.

The decrease in the United States since the pre-war years in consumption per person of cereal foods, principally wheat flour and cornmeal, has reduced the area of these crops needed to feed a person from about 0.34 acre to 0.26 acre, or by about one-twelfth of an acre; while the increase in consumption of milk, pork and vegetables has increased the area per person needed to produce these products by an eighth of an acre. Nearly all the increase in sugar consumption has been supplied by Cuba, Porto Rico, Hawaii, and the Philippines, so it has not been included in the estimate. However, if this increased amount of sugar were produced within the continental United States it would require only 0.01 acre of beets per person, or 1,250,000 acres for our 123,000,000 people. The net result, therefore, of the change in diet has been an increase in crop land needed to feed each person of about one twenty-fourth of an acre.

This is a very small amount of change; and in view of the fact that the high ratio of natural resources to population in the United States will very probably persist, there seems little likelihood of such a change in diet occurring as would reduce the area of crop land required for domestic needs to any such per capita figure as that for Germany, for instance. The safest assumption, perhaps, is that the present acreage requirement per person will be subject only to such reduction as results from progress in agricultural technique, and a stationary domestic supply of beef with correspondingly increased supply of pork and milk.[16]

The prospect for consumption of farm products in the United States, therefore, assuming no rise in the birth rate, nor in immigration, and approximately the present per capita consumption, is ten to twelve per cent larger a decade hence, eighteen to

[16] For a population a third greater than at present, this would mean a per capita consumption of foodstuffs, measured in crop area, only about 3 per cent less than at present, excluding changes in agricultural technique.

twenty per cent larger twenty years hence, and about twenty-five per cent larger thirty years hence, when it may become approximately stationary for a few years and then decline.

Export Demand

The trend of net exports of agricultural products from the United States, which have required from a fifth to a tenth of the nation's crop acreage for their production, was downward from the beginning of the twentieth century until the years just preceding the World War. (Fig. 5.) This was owing mostly to

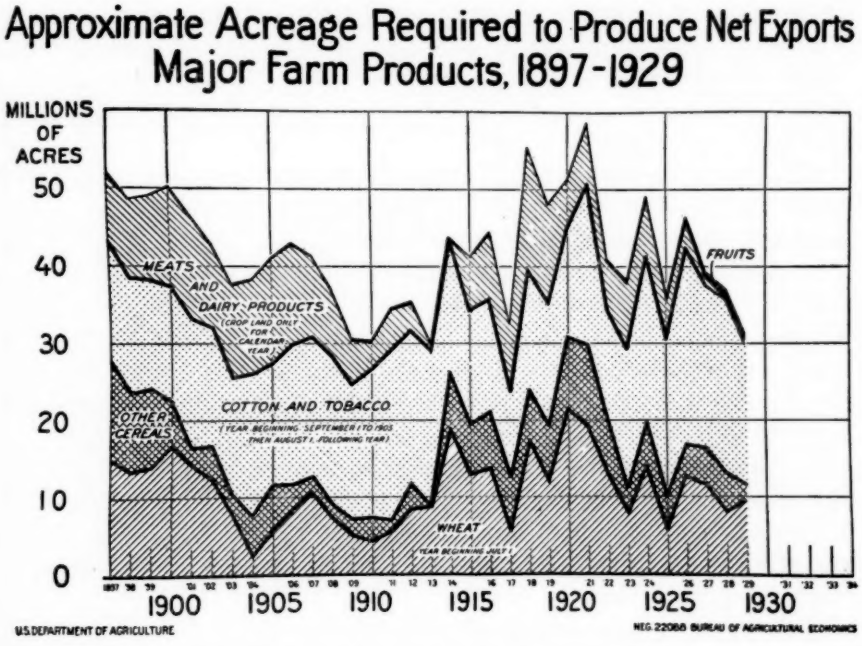

FIG. 5. Acreage required to produce net exports decreased markedly since 1920 for meat and dairy products and for wheat.

decline in cereal exports, which reached their lowest point in the fiscal year 1911-1912. Between 1911-1912 and 1921-1922 total exports, as measured by acreage required to produce them, almost doubled (though falling to a low point in 1917-1918), reaching in the fiscal years 1918-1919, 1920-1921, and 1921-1922 higher points than in the period of opulence at the beginning of the century. This rise was likewise owing largely to the increase in cereal exports, principally wheat, except that in 1921-1922

there was an unusually large export of cotton and of corn, measured in acreage required for production. From 1922 to 1926 total agricultural exports were well maintained, but during the four years since have declined rapidly. This decline is owing also to the cereals in large part. The acreage required to produce the cotton and tobacco exported has been increasing irregularly since the War, and that represented in the fruits exported has been increasing rapidly. However, it is still small.

The acreage required to produce the agricultural exports was lower in the fiscal year 1929-1930 than in any year since the beginning of the century, and only half as great as in 1921-1922. It seems probable that the exports in 1930-1931 will continue low. The crop area required to produce the exports of animal foodstuffs (mostly lard and pork) now only slightly exceeds that which would be required to produce the imports (beef, lamb, milk, and dairy products).

The significance of this rapid decline in agricultural exports since 1926 is not yet clear. Undoubtedly the reduction in the purchasing power of European peoples, owing to diminution of American credit and other factors, the increase in European tariffs on agricultural products, the decline in the value of silver, which has affected the purchasing power of oriental peoples, and many other factors have exerted an influence. But it is interesting to note that this recent great decline in agricultural exports has coincided with a decline in total agricultural production just as it did from 1907 to 1910. Whether exports will increase with the increase in production which may be expected as weather conditions become more normal only the future can reveal. The situation is complex, and political as well as economic considerations are involved.

This much, however, may be said:

(1) The imports of beef, which have exceeded the exports every year since 1921, were increasing until recently.
(2) The imports of dairy products have slightly exceeded exports for 8 years, but are not increasing.
(3) The exports of pork have declined, but not rapidly in the last four years, while the exports of lard have been maintained.
(4) The exports of corn and rye have almost vanished.
(5) Unless wheat production decreases or per capita consumption increases, exports may continue for two decades.
(6) The exports of cotton have been greater in recent years

than ever before, and there is no prospect of domestic consumption approaching production.

In brief, the export surplus of animal products, with the exception of lard and, to a less degree, of pork, no longer exists. If the production of pork and lard does not increase and per capita consumption remains at the level of the last ten years, the exports of pork will be required for home consumption in four years, but lard exports are sufficient to supply 50 to 60 million people having the present American per capita consumption, which is more than the probable increase in the nation's population. For lard and cotton, therefore, there is little hope of imports exceeding exports in the future, but for wheat this condition may be reached in about twenty years.

NOTE: The prospect for production of these three commodities in foreign lands, as it affects the outlook for land utilization in the United States, will be omitted.

Summary

In our efforts to foresee the future need for farm land in the United States and its utilization in various parts of the country, we have four major groups of facts to guide us, two of which are dependable with reference to the future because of their physical character, and two less dependable because of their social character.

The first fact is this: The soil resources of the United States are being depleted rapidly, and many millions of acres of land formerly cultivated are being abandoned largely because of erosion. But fertilizers and crop rotations, including use of legumes, can restore the elements of fertility lost by crop removal and leaching, and there is much lowgrade and medium grade land, now in pasture or forest, that can be cultivated to replace the land lost by erosion. On the other hand, there is much eroded or depleted land that will revert to pasture or forest. The depletion of resources, however, tends to increase the cost of production; and the loss of soil by erosion, particularly, will cause serious local and even regional declines in agricultural production and income, accompanied, doubtless, by increases in production and income in other parts of the nation.

Second: There has been very little increase in total crop acreage or acre-yield since the World War, and the amount of crop feed and pasturage has remained about stationary for 15 years, the "agricultural surplus," which has developed despite an in-

creasing population, being due almost wholly, from the production standpoint, to the large amount of feed released by the decline in horses and mules, to increasing production of meat and milk per unit of feed consumed, and to shifts from the less productive crops per acre and less productive classes of farm animals per unit of feed consumed toward the more productive. All four of these factors are likely to exert an influence for at least ten years, and possibly 25 years to come; but as the saturation point in use of automobiles has, apparently, almost been reached, and shifts from the less productive toward the more productive crops and farm animals are diminishing, it seems probable that the increasing population soon will require some increase in crop area,—unless a great increase should occur in the use of fertilizers.

Third: The number of children born in the United States each year is declining, and unless the birth rate rises, which is improbable, or unless the immigration laws are liberalized, a stationary population of about 160,000,000 will be reached about the year 1960, followed by a slow decline. Thirty years hence, therefore, assuming a stationary per capita consumption, the domestic need of the Nation for agricultural products appears likely to be 25 to 30 per cent greater than at present. This involves only a little greater increase in production than that which occurred between the abnormally low year 1921 and the high year 1926. Such an increase would provide also for the maintenance of our present exports of farm products. The rate of increase in production will need to be more rapid in the earlier years than in the later years of this thirty-years period before a stationary population is reached, but at no time need it exceed 1.5 per cent a year, unless exports increase greatly, as contrasted with over 2 per cent annual increase, on the average, since the World War.

Fourth: The approach of a stationary and probably declining population doubtless will enhance the interest in exports of agricultural products. At present an important export surplus exists only for cotton, tobacco, wheat, lard, and several fruits. Thirty years hence, if the present stationary trend in the production of wheat and in per capita consumption continues, there will be no export surplus, but the price of cotton, tobacco, and lard at least will, very likely then, as now, be determined largely by the world's markets. Those markets may be larger, particularly if China develops into an industrial nation and is able

to ship products to the United States in payment for the cotton, tobacco, and food products.

This question as to the future foreign demand for American farm products introduces a great uncertainty into the outlook for land utilization. The agricultural land resources of the United States are greater than those of Europe, excluding Russia, and probably are almost equal to those of the Orient; yet there are only about 125,000,000 people in the United States at present, and never likely to be over 165,000,000, as compared with nearly 400,000,000 in Europe, excluding Russia, and, possibly 1,000,000,000 in the Orient. Can such a disparity in ratio of resources to population persist permanently? Will it be found advantageous to export a large proportion of the nation's agricultural products to these lands of dense population, receiving in return such products as they offer?

The answers to these questions will depend upon many factors among which the most important, probably, are the progress that may be made in agricultural technique, both in the United States and abroad, and rate of advancement in the standard of living, particularly in the Orient.

What I have given is not the outlook, I realize, but only some of the factors that affect the outlook for land utilization. The uncertainties in the situation, such as changes that may occur in our immigration policy, changes in tariff policy, both in the United States and abroad, the possibility of rapid industrialization in the Orient, are too great to permit any definite conclusion. But of these things we may be sure,—that the soil resources are being depleted, often wasted; that there will be further progress in agricultural technique; that there will be notable regional shifts in production; that prices of several farm products will continue to be affected by world conditions and national policies; that public action will be necessary to solve some of the vast problems of land utilization; and that those farmers who keep their eyes on the future, keep in touch with the men and institutions provided for their guidance, and do not fail to do their daily work well, are very likely to succeed.[17]

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[17] The conclusions reached in the preceding discussion of changes in agricultural production and consumption are based mostly on the published estimates of the Bureau of Agricultural Economics and on the Census of Agriculture, with division of each product into the portions used for human food, for livestock feed and for other purposes made in most cases on the basis of the returns to the Census of Manufacturers. There are, however, several notable exceptions:

1. The estimates of wheat production and consumption are those made by Holbrook Working of the Food Research Institute of Stanford University, and published in Wheat Studies, Vol. IV, No. 2, entitled "Statistics of American Wheat Milling and Flour Disposition Since 1879."

2. Estimates of rice production and consumption for 1922 to date are those of the Rice Millers' Association.

3. The estimates of fruit production and consumption, in addition to the estimates of the Bureau of Agricultural Economics, are based on the various research studies of the Department of Agricultural Economics, of the University of California, supplemented by railroad reports on citrus shipments from Florida and a few minor miscellaneous sources.

4. The estimates of milk production and consumption prior to 1917 were made by the writer using every meagre material, principally Bulletin 55, Bureau of Animal Industry by H. E Alvord (1903) and Bulletin 177, Bureau of Crop Estimates, by Eugene Merritt (1915), with estimates for intervening years based largely on per capita milk consumption data for Boston, New York and Philadelphia and on the production data in the Census of Agriculture and consumption data in the Census of Manufactures.

5. The estimate of the amount of crop feed consumed by horses and mules is based on cost records of the Bureau of Agricultural Economics and State Experiment Stations, and was calculated for each State.

The conclusions cannot be free from errors contained in the statistical data used. Several of the graphs suggest that these errors may be material. Any precise figure given in the text, therefore, must be considered as approximate. Precise figures are given because it seems better to do so than to be satisfied with a general statement which has only qualitative value and frequently little meaning.

However, the person who uses these figures may wish to have some idea of the magnitude of the possible errors. Such estimates of error can be merely personal opinion, and the writer ventures the following judgments solely on his own responsibility.

The Census figures for population of the United States, used in calculations of consumption per person, may be a few per cent too low, but are probably closely comparable from decade to decade. These are, in all likelihood, the most accurate figures used in the study. The agricultural census data contain errors of a similar or greater magnitude and mostly in the same direction. The annual estimates of crop acreage and production made by the Bureau of Agricultural Economics may for certain crops and in certain years be closer to reality than the Census statistics, but the further removed these estimates are from the Census year the greater is the probability of error. The annual estimates of numbers of animals on farms January 1 are subject to similar limitations, except that the indications afforded by changes in number of animals assessed for taxation, in receipts at over 60 markets, and in inspected slaughter are also available as a basis for revising the preliminary estimates.

Finally, with reference to the estimates of production of meat and milk, although the basic data are less satisfactory than those on number of farm animals, the trends agree more closely with the trends of human population, and when combined with other foodstuffs into an index of per capita consumption result in totals that are remarkably constant.

In reading this discussion of production and in studying the graphs it should be kept in mind, therefore, that there are undoubtedly errors in details, possibly involving serious divergencies from reality in certain time relationships portrayed. Nevertheless, the changes indicated by the data not only are real, in the writer's opinion, but also the magnitude of the change is approximately as indicated, except, possibly, in production of pork and lard per hog on farms and in production of milk per cow.

The estimates of acreage and production of the principal crops prior to 1909 are being revised at present, and the 1930 Census of Distribution, as well as of Agriculture, will contain valuable data on production of meat and milk in 1929. These new data may indicate changes in the index numbers for both the early and the late years of the 30-year period

NATIONAL LAND POLICIES IN RETROSPECT AND PROSPECT[1, 2]

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BUREAU OF AGRICULTURAL ECONOMICS

Introduction: The Outlook in General

Broadly speaking, the epic of land settlement is complete. The unreserved public domain consists of land unsuited for cultivation, and its problems are of a special character and, viewed from the standpoint of agriculture as a whole, of relatively minor significance. The land problems of the future have to do mainly with the utilization of lands in private ownership, and are all the more difficult on that account.

A problem of immediate and pressing importance with which we shall be occupied for a number of years is the liquidation of the results of agricultural overexpansion in this and other countries and the wastage of soil and timber. Hundreds of communities are confronted with difficult problems of fiscal and institutional readjustment growing out of the passing of timber resources, farm abandonment, reduced farm incomes, shrunken land values, and increased tax delinquency.

In time new lands will be brought into cultivation. This will involve the processes and problems of land settlement and also the less spectacular, but not less important, process of resettlement; that is, the regroupings of farm population dictated by the development of hitherto neglected opportunities in already settled areas or the utilization of lands within such areas which become possible of cultivation as a result of changed technical and economic conditions. In the occupancy of free land the aggregate of human suffering, wasted effort, and disappointment was appalling; in the process of resettlement the possibilities of wastage and maladjustment are perhaps equally great. Although the present-day settler is not compelled to grapple with the Indians, the land yet to be occupied is in general of more doubtful utility than when fertile bottom lands or virgin prairies were to

[1] Paper read at twenty-first annual meeting of the American Farm Economic Association, Cleveland, Ohio, December, 1930.

[2] Despite the title of this paper, I shall not undertake a résumé or critical review of past land policies. I shall refer to such policies only as they may be responsible for the kinds of problems that confront us as we face the future.

In outlining a general program, one is likely to appear to be not conforming to the standards of "realistic economics." A program is necessarily idealistic; therefore, it must reflect largely the ideals of the author, and another might cherish a different ideal. Moreover, it is clearly impracticable to give substantiating facts in a brief paper, although the program here outlined is in large measure the product of studies and observations covering somewhat more than a decade. At that, it is but a stage in the evolution of ideas.

be had for the occupancy; it frequently bears a price that may be as great a potential cause of failure as the characteristics of the land itself; to a large extent it is disposed of by private agencies little concerned with public welfare; and the settler must perforce develop a commercial economy in order to pay for his land and maintain a modern standard of living.

Necessity has forced the Nation to undertake the gigantic task of rationalizing agricultural production. It is essential, therefore, that we take steps to avoid temptation to overexpansion occasioned by our half billion acres of uncultivated land physically capable of cultivation, the overexpansion that is continually stimulated by the efforts of local interests eager to push lands into use irrespective of the consequences to agriculture as a whole. Economic rationalization will also require preventing, so far as possible, the tragic mistakes in the opening up of new areas to cultivation, finding new uses for land not economically adapted to farming, and making adequate provision for forests to satisfy our future needs for timber, protect our watersheds, afford refuges for game, and provide recreation.

The process of agricultural expansion will frequently require the reclamation of new lands on a scale which can be accomplished only by collective effort. We are entering upon a new epoch in reclamation policy, and are confronted with the serious problem of correlating it with the general task of rationalizing agricultural production.

Such are the types of problems to which I invite your attention and which I shall be able to touch upon only briefly.

The Research Foundations of a National Land Policy

You will probably smile when I say that the essential foundations of future land policy must be laid in research; congressional committees, especially, are inclined to believe that government men have no other solution for economic problems. However, most of our land of any significance is in private ownership, and therefore largely beyond the legislative pale; at least, mainly beyond the constitutional boundaries of federal legislation. Therefore, we must depend mainly on research and education to control its utilization.

A primary element in such a program of research is the development of a long-time outlook with reference to agricultural production and national land requirements as they are affected by population growth, changes in consumption and in the other

conditions that affect national and international demand for farm, range, and forest products, and changes in methods of production as they influence the land requirements of the Nation. Such a long-time outlook, modified from time to time as conditions change, constitutes an essential basis for local judgment concerning land utilization, reclamation, and settlement. We have made a small beginning in the Department along this line, but an adequate long-time outlook demands a far greater division of labor and a greater degree of intensity in research. We shall find it important to consider the land resources of foreign countries, particularly of important competitors such as Argentina, Canada, Australia, and Russia. But, as "charity begins at home," we need to take stock also of our own potential land resources available for cultivation, pasture, and forests. We have made some rough estimates, but the margin of error is extremely large. By synthesizing available data on geology and soils, topography and climate, taking stock of existing uses and reservations of land for various purposes, supplementing this material by field work here and there, we can reach reasonably accurate conclusions as to amounts of land available for the major uses, not only for the Nation as a whole, but also by regions.

The formulation of a national outlook with respect to land requirements and available resources should be brought still closer home by development of regional long-time outlooks for land requirements, related to the national outlook but taking account of the special lines of production, demand conditions, and land resources of each region. Such an outlook, for instance, that would give us some conception of the prospective further expansion of wheat and cotton in the Great Plains would be extremely helpful.

These national and regional outlook estimates supply the necessary background for the economic classification of land in particular regions. The definition of the agricultural margin of utilization implied in such a classification would not be determined strictly in accordance with the classical concept of a margin, though this constitutes a useful point of departure.[3] Public policy will require attention to a number of other considerations, such as the following:

(1) The distinction between the level of income justifying expansion and the somewhat lower level necessary to jus-

[3] I have discussed this point more fully in a paper presented at the recent meeting of the International Conference of Agricultural Economists at Ithaca, New York.

tify abandonment after the land is improved and the farm has become a going concern.

(2) The difference in value of labor in various regions and, for the time being, the alternative employment—opportunity of the working members of particular families.

(3) The alternative opportunities for employing capital, particularly a small capital handled by an unsophisticated investor.

(4) The tangible and intangible elements in real income connected with scenery and climate, community institutions, and general social environment.

(5) The financial, psychological, and social costs of moving to another environment.

(6) The effect of occupancy or abandonment on the desirability of maintaining schools, roads, and other local utilities, on various dependent industries and occupations, and on the conservation of natural resources.

Redirection of Economic Life in Economically Subnormal Areas

I do not propose this procedure for regions like the best of the Corn Belt nor at the other extreme for extensive regions of the Intermountain section obviously adapted only to a grazing economy. I consider it necessary only for areas where the question of where agriculture should stop and other uses begin is undetermined, and for some time to come I would confine the undertaking to areas in serious economic distress by reason of the decay of agriculture, the passing of timber resources, or both these conditions. Furthermore, I would limit the task for the present and immediate future to areas where there is actually or potentially a consciousness of the need for redirection of the economic life and a prospect of organized cooperation in formulating and carrying out an economic program.

For such areas the following lines of action could be made to grow out of the economic classification of the land:

(1) Formulation of an economic program for the area.

(2) A discriminating extension policy to encourage the abandonment of farming lands incapable of maintaining a reasonable standard of living and to facilitate such abandonment by supplying information concerning agricultural, and possibly industrial, opportunities in other areas.

(3) Promoting agricultural reorganization on types of land where this appears prerequisite to continued occupancy.
(4) Recommending legislation or local fiscal readjustments necessary to permit profitable forestation on land unsuited for cultivation.
(5) Defining areas that should be publicly acquired for various purposes and reasons and promoting the necessary State or Federal action, taking into consideration the availability of tax-delinquent lands or abandoned farm lands, the formation of compact administrative units, economies in the maintenance of local and State revenues, and the various public advantages derivable from public ownership.

Gradually, I should hope, the program of classifying the land, formulating a program of utilization, and replanning community life would be extended to areas where economic distress and disorganization are less acute. If we take a small-gauged view of our agricultural economic problem in this country, we shall shrink from this task as one involving too much expense; but if we think that we do not hesitate to spend $5,000,000 or $10,000,000 on a comparatively small reclamation project or that the Farm Board has risked many millions of dollars in an attempt at temporarily stabilizing the price of a single commodity, the expenditure of a few millions over a period of a decade or more in working out a program of land utilization does not appear a staggering proposal, particularly if we set it over against the enormous wastage in human and natural resources that results from a policy of *laissez faire.*

Relation of Agricultural Land Utilization Policy and Forest Policy

We have permitted the wasteful cutting away of timber resources without considering their vital local importance to agriculture and the general public welfare in supplying fuel, posts, and lumber, providing raw materials for local industries, furnishing local markets and part-time employment, contributing to local fiscal requirements and the maintenance of public and quasi-public institutions, regulating the flow of streams, and preventing erosion. These considerations indicate the importance of dealing with the problem of rural land utilization as a whole and integrating agricultural and forest land policy.

There is danger, however, of a misconception of the relation-

ship. An instance of this is the proposal to buy up large areas of agricultural land and devote them to forests as a means of overcoming the agricultural surplus. Such a point of view is embodied in a bill introduced in the present Congress. (H.R. 3569, 71st Cong., 1st Sess., May, 1929.) There are a number of limitations to this method of approach. As a means of increasing the forest area, the method necessitates the heavy legal and administrative costs of purchasing land in small units and at the relatively high prices that must be paid for cleared land and for buildings and other improvements even though the farms acquired are essentially submarginal for farming. As a means of reducing overproduction, it is open to the objection that the price level for farm products is largely international; nor would the measure provide any means of preventing further expansion in this country. Moreover, the percentage of crop land in such submarginal areas is small in proportion to the total area acquired.

Some land previously in farms will be devoted to forests, public or private, as an incident of the task of redirecting economic life in subnormal areas, but such acquisition should be carried out only with due consideration of its influence on local institutions and on local revenues and expenditures, as well as with regard to other economic and social consequences. Unless unforeseen changes occur in consumption requirements, we shall have to reduce seriously our level of timber consumption within a few decades because of scarcity, and present economic conditions do not appear to stimulate extensive reforestation by private enterprise. The outlook, therefore, emphasizes the need for a far more extensive program of public acquisition than we have yet developed, the greater part of which should be carried out by purchase of cheap land in large blocks. Fortunately, we have plenty of land that can be devoted to forests, probably a half billion acres, of which around 350 million acres are absolute forest land.

Liquidation of Financially Embarrassed Reclamation Projects

The liquidation of financially embarrassed reclamation projects is an important phase of the task of economic rehabilitation. There is evidence that the number of embarrassed projects is large.[4] Apparently there is a disposition for creditor interests

[4] For instances, I am informed that in Montana only about 5 out of some 60 irrigation districts, not considering Federal projects, are in sound financial condition. In a study of drainage districts of the South, made in 1926, it was found that of 34 districts reporting

to scale down the indebtedness or postpone payments of embarrassed districts as a necessary business expedient; and there is obviously a need for a competent and impartial determination of what proportion of the existing indebtedness can be borne by the farms of each such district.

For several years there has been a movement for a more drastic method of dealing with this problem. It has taken the form of a bill providing that the Federal Government shall appropriate a sum amounting to $90,000,000 for refunding the indebtedness of drainage districts, receiving in return new bonds repayable over a period of 40 years without interest. Administration of the measure is assigned to the Secretary of the Interior, who is enjoined to make the necessary investigations to make sure that legal provisions and the economic status of each project warrant the expectation that payments on principal will be met as they fall due. In the course of time certain changes have been made in the provisions. For one thing, they have been amended to apply also to irrigation districts. Both the Senate and House Bills (S. 4123 and H.R. 11718, 71st Cong., 2d Sess., 1930) now provide for scaling down the face value of outstanding indebtedness to actual present value through agreement with bondholders. The Senate bill specifies that this shall be the market value as of March 1, 1930.[5] Both bills provide that in case the Secretary finds the value of the security is less than outstanding indebtedness, present creditors must agree to accept second lien bonds for the excess. The House Bill has incorporated a provision that bonds issued to the Federal Government shall bear interest at 3 per cent, which shall not begin to accrue until five years after issuance of the bonds. The Senate bill, however, provides for bonds not bearing interest. There is a great deal of power back of this proposed legislation. It passed the Senate at the last session of Congress, and was reported favorably by the House Committee on Irrigation and Reclamation.

It is not my purpose to condemn or approve these proposals. It may be that lifting some of the interest burden from the backs of the farmers, providing virtually a moratorium for several years, and amortizing their indebtedness over a long period, is

the status of payments on outstanding bonds, eight were in default. Three others would have defaulted had they not secured assistance from the bondholders in technically meeting obligations. "Economic Status of Drainage Districts in the South in 1926," by Roger D. Marsden and R. P. Teele, *Technical Bulletin* No. 194, U. S. Dept. of Agr. According to information issued by the State Engineer of Texas on the condition of 63 districts having outstanding bond issues, 53 report tax delinquency, amounting in the aggregate to $347,717.11 out of a total due of $679,209.73. Thirty-three districts report payments overdue on bonds.

[5] Apparently, with a view to avoiding refunding on the basis of the increased valuation of outstanding bonds otherwise certain to result from passage of the legislation.

a more direct form of farm relief than other measures already enacted or proposed. But whether justified or not, a program to pay off debts of those who have been unfortunate in the economic struggle involves significant questions of precedent that cannot be ignored in a discussion of national land policy; whether the distinction that the aid is supplied to municipal corporations rather than to individuals can be maintained against counties and municipalties confronted with difficulties in meeting payments on indebtedness, against the distressed owners of farm land outside of drainage and irrigation districts, and against other kinds of small business enterprises. It is notable also that no distinction is made in the proposed legislation between districts in financial distress and those capable of meeting their obligations promptly. Furthermore, the measure may provide an additional precedent for extending the Federal Reclamation policy of interest exemption on costs of construction in the West to other parts of the United States, and possibly on a larger scale.

Agricultural Expansion and Land Settlement

Even while we are engaged in liquidating the results of past overexpansion in areas seriously affected thereby, expansion will continue in other areas. No long-time land policy will be complete that does not provide a means of furnishing information and guidance to prospective settlers and aid to land settlement concerns in determining the agricultural and economic feasibility of proposed projects. Yet, barring the experiments in State regulation described in Dr. Hartman's paper, which as a whole have proved inadequate or ill-conceived, no serious attempt has been made to grapple with the problem of guiding and directing the course of agricultural expansion. We have not adequately brought together the essential physical and economic facts on an areal basis nor formulated economic judgments with respect to the advisability of cultivating various types of unoccupied land, and the land values and developmental costs that can be economically undertaken.

The function of guiding and directing land settlement should be integrally connected with the process of land classification and the formulation of a program of land utilization already outlined, and so far as possible by the cooperation of the Federal Government and the states. Their far-flung extension and publicity facilities should be employed not only to make the economic infor-

mation available to those who want it but also to make known to intending settlers throughout the country the availability of the service. If this policy should be carried out vigorously it would be more effective than regulation; and in time it would stimulate promoters of reclamation and settlement projects to seek the aid of governmental agencies in determining in advance the agricultural and economic feasibility of their projects and the soundness of their program of sale and settlement.

Encouragement of Home Ownership by Small Farmers

Our traditional land policy has been aimed at the development of middle sized farms. Though the economy of the pioneer has been economically a small-scale economy until the land was cleared and the farm developed, he was given enough land to constitute potentially a family farm of middle size. Recently we have heard much about large-scale farming, and we have been so preoccupied in studying the financial and organizational problems of commercial farms of large or middle size that we have lost sight, more or less, of the relative significance and special needs of the class of small farmers. Yet, this class is very numerous, and very important from the point of view of the human and social values of rural life. There are at least 2,000,000 and possibly 2,225,000 small farmers, about one-third of the total number of farmers.[6] They include the numerous mountain and hill farmers; white and colored cotton tenants; tobacco tenants; numerous small farmers engaged in raising truck crops, small fruits, and poultry; and a good many small farmers in general farming regions, handicapped by inadequate capital or other limitations. Some of the last two groups comprise the so-called "amphibians," whose economic problems frequently are partly urban and industrial. The popular orator is wont to declaim that we have not and should not have a peasant class in America. The fact is, fully a third of our farmers maintain and always have maintained an economic existence that is not essentially above that of peasants. In fact, there are peasants and peasants: at one extreme are the well-trained, prosperous, and thrifty peasants of Denmark and Holland; and at the other extreme, the ignorant, poverty-stricken, and hitherto oppressed and exploited

[6] According to the census of 1925, there were 966,584 farms under 20 acres and 1,450,643 containing 20 to 49 acres. The first group had an average of less than 8 acres of crop land per farm, and the second group about 20 acres. The average value per farm of the first group was about $2,500, including value of residence and other buildings, and of the second group a little less than $3,000. Among the groups larger than 49 acres, there are doubtless numerous farms, especially in areas of rough topography, which are in every sense small-scale enterprises.

peasants of eastern Europe. We have numerous small farmers whose standard of living is lower than that of the first group.

It is evident on every hand that these small farmers of America, many of whom have hitherto maintained only a semi-commercial economy, are being subjected more and more to the white heat of modern competitive forces and the disturbing influence of pecuniary standards of living, while in the South the control elements formerly provided by the plantation system have broken down in certain areas. For various reasons the National Farm Loan System and the Intermediate Credit Act are not adapted to the peculiar needs of small farmers, the Extension Service only partially reaches them, and a large proportion have not been drawn into the circle of cooperation. As a class they are not adapted by experience, capacity, and resources to the operation of middle-sized commercial farms requiring a considerable investment of capital. Outside of their present position their alternatives are either to become hired laborers or to drift to cities. Undoubtedly some members of the class will leave the country, but a large proportion are likely to remain; and their problems are worthy of careful consideration.

To outline a program for the small farmer is beyond the possible scope of this paper, but I may at least indicate tentatively some important elements in such a program. They include:

1. Education and extension work adapted to the peculiar needs of this class. Fortunately steps are being taken in both directions, but there remains much room for progress.
2. Bringing to the small farmer the benefit of cooperation, not only in marketing ordinary farm products, but also in such tasks as trucking and sale of woodlot products, sale of incidental lots of eggs and poultry produced outside of specialty areas, short term credit, ownership of machinery and breeding stock, and miscellaneous forms of cooperative self-help.
3. A system of combined mortgage and personal credit designed to promote home ownership, and differing from prevailing systems in the following regards:
   (a) A margin of credit larger than under existing conservative credit systems, conditioned on agreement to follow a specified system of farming and of farm improvement and development.
   (b) Restrictions on resale or leasing.

(c) Assistance in selection of a farm and in the legal formalities of transfer.
(d) A very low rate of interest and long-term amortization.
(e) Insurance policies for the protection of the borrower and the lending agency against death and other contingencies.
(f) Careful selection of individuals who should be encouraged to undertake the obligations of farm ownership.
(g) Contribution by the Government of some or all of the administrative costs of maintaining the system as an expenditure justified by the advantages to the general public.

Need for a Comprehensive National Policy with Respect to Reclamation

The assertion that the Nation should develop a comprehensive policy with respect to reclamation may sound strange, coming from the present writer. This statement, however, emphatically does not mean that there is need in the present or immediate future for the reclamation of more land at federal expense. Although the policy was initiated, and for many years justified, as a means of increasing the Nation's supply of farm products, even as a means of averting an impending scarcity, there has never been a time in our history when it was necessary to subsidize agricultural expansion as a means of maintaining an adequate volume of farm production. In the recently issued bulletin,[7] *Land Utilization and the Farm Problem,* as well as in other publications, facts have been submitted which indicate that the essential problem of the next decade is likely to be one of preventing overproduction. Nevertheless, the greater part of our most fertile land yet uncultivated requires reclamation, frequently at heavy cost, and in such agricultural expansion as may be required, reclamation will go hand in hand with the settlement or resettlement of areas not needing expensive drainage or irrigation.

We are face to face with a powerful movement for the broadening of reclamation policy which cannot be ignored by those interested in the development of national land policy. During the past fifteen years a number of bills designed to make federal

[7] Miscellaneous Publication No. 97, U. S. Dept. of Agr.

reclamation nation-wide have been introduced in Congress, starting with the Lane-Mondell Bill for a federal colonization program. One of the latest developments with widespread backing and support is the Buchanan Bill (H.R. 9335, 71st Cong., 2d Sess., 1930), which provides for establishing in the Department of the Interior a "National Reclamation Control Service." On application by any state or political subdivision the Service shall investigate the feasibility of the proposed project, and if found to be feasible and the security for repayment of construction costs is considered adequate, the Secretary is authorized to proceed with construction, advancing the necessary expenditures out of a revolving fund of $100,000,000, the advances to be repayable over a period of 40 years without interest.

The movement is the result not merely of the pressure of local interests to get Federal funds for the furtherance of local advantage; it is the outgrowth also of certain significant developments that may be briefly summarized as follows:

1. On account of the unfavorable financial record of numerous reclamation projects, private funds for reclamation construction are difficult to obtain.
2. The cost per acre of irrigation projects yet remaining to be constructed will be very high,[8] probably higher than settlers can afford even when subsidized by exemption from interest payments on construction costs.
3. The piecemeal method of dealing with drainage by the development of local drainage and levee projects has demonstrated its serious disadvantages. There are important advantages in utilizing and controlling the water, particularly of a large stream, as a unit, rather than by a fragmentary procedure.
4. Unified stream control includes functions, such as improvement of navigation and protection of life and property, falling under the general functions of Government, in addition to conferring specific individual or local benefits. The more important future reclamation projects, therefore, are likely to be of considerable magnitude and to involve stream control, water power development, and at times problems of interstate jurisdiction in use of water.
5. Studies of feasibility for local reclamation projects, however adequate from an engineering standpoint, are likely to be sadly lacking from an agricultural and economic stand-

[8] *Annual Report* of the Secretary of the Interior, fiscal year ended June 30, 1930, pp. 19-21.

point. There is frequently an inadequate perspective concerning general economic trends, the outlook for agriculture, aggregate contribution of such reclamation to agricultural expansion, and the possibilities of using land not requiring reclamation.

Whether we like it or not, therefore, we are confronted with the fact that a considerable part of future reclamation by drainage or irrigation is likely to require national as well as state and local participation. It is important, therefore, to consider along what lines such a policy should be developed in order that it may be truly national in scope and objectives rather than merely local and particularistic.

For one thing, there should be unification of national policy. While the Department of the Interior is administering federal reclamation, the War Department is engaged in reclamation of agricultural land as an incident to flood control: sometimes directly and sometimes indirectly; sometimes involving the reclamation of new acreage and sometimes the rendering of greater protection to lands already in cultivation.[9] Finally, the functions of determining the agricultural economic feasibility of new reclamation projects, appraising their significance in relation to the general or regional outlook for agriculture, and watershed protection through forest administration and control of erosion are essentially agricultural as to the character of requisite personnel.

Reclamation should be required to pay its own way. The policy of interest exemption on federal reclamation projects is a method of subsidizing agricultural expansion which has increased the total cost of federal reclamation to the Nation by about 50 per cent, on a conservative basis of estimate.[10] A policy of subsidizing expansion on a small scale would be far more serious as a competitive menace to established farmers if extended on the scale contemplated in the proposed legislation. In the long run, moreover, a subsidy of this character not only is unnecessary to an adequate volume of production but also tends to promote an artificial level of capitalization which is likely to be found too high for those who will subsequently acquire the land for operation.

[9] The potential magnitude of this activity in land reclamation is suggested by the fact that on January 2, 1927, Congress appropriated $7,000,000 for "Examinations, surveys, and other investigations of navigable streams with reference to possibilities of water power development, improvement of navigation, control of floods, and irrigation." Out of a potential total of 196 examinations, 132 have received some attention.

[10] See "Land Reclamation Policies in the United States" by R. P. Teele, Department Bulletin No. 1257, U. S. Dept. of Agr., pp. 7-14.

In the case of projects aimed not only at reclamation but also at water power and flood control, the determination of the specific share assignable to reclamation benefits is difficult; but however determined, it should be paid for by the region benefited, and deferred payments should bear a reasonable rate of interest. Such a requirement would check considerably the local pressure for ill-advised projects. A bill recently introduced (H.R. 16249, 71st Congress, 3d Session) provides that for future projects the cost of the power system, "including structures and other facilities provided and used primarily for irrigation purposes but incidentally used in connection with and as a part of said power system, shall be returnable from power revenues and shall not be charged to or repaid, in whole or in part, by the water users of the project." Presumably, this would permit the construction of a reservoir wholly at the charge of the power development, and water users would be relieved of financial responsibility for its cost. Any net revenues derivable from the power development, it is provided, would not be credited to the water users, but would be covered into the reclamation fund and applied to the cost of constructing new projects in the same state provided the Secretary of the Interior finds this necessary in order to render the new projects feasible.

The agricultural possibilities and economic feasibility of projects should be determined on the basis of a thorough investigation to be beyond a reasonable doubt, with due reference to the outlook for agriculture and the general need for agricultural expansion, both in the locality, and in the Nation as a whole. In short, reclamation, whether private, district, state, or federal, should be closely coordinated with the policies of rationalizing agricultural production and land utilization already described.

National participation should be confined mainly to projects in which reclamation is inseparably connected with the accomplishment of other objectives truly public in character, such as the control of floods and provision for navigation.[11]

The Land Problems of the Unallotted and Unreserved Public Domain

Although the land problems of the public domain no longer bulk very large in our general agricultural problem, they are

[11] Whether the development of water power shall be regarded as properly a public function will necessarily depend on the issue of the question, now undetermined, whether the adequate protection of consumers and regulation of rates can be accomplished more effectively under public ownership than under private ownership with public regulation.

In the case of projects that include the exercise of recognized public functions such as

of concern to one of the large sections of the country, and a discussion of national land policy would not be complete without a discussion of these problems. They have been under consideration by a Presidential Commission for more than a year, and the conclusions of the Commission have just been made public. In view of the present writer's official connections comment on the report or discussion of the subject with which it deals appear at the moment inappropriate.

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flood control and navigation, the distinction between what is local and what is national in scope is not economically the distinction between state and inter-state, though this may be the ground for legal distinction. For instance, in the small New England States there are streams, little above the size of creeks, that are inter-state, while in Texas the huge Brazos River system, upwards of 800 miles in length, is virtually intra-state.

RECLAMATION POLICIES IN THE PACIFIC STATES[1, 2, 3]

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Although the supply of free arable lands has been practically exhausted, there is still an American frontier where human progress and prosperity are advanced by increasing population and the development of natural resources. The westward movement continues. This is indicated by a phenomenal population growth in the Pacific States, particularly in California where the number of persons has been increased 65 per cent in the past ten years, and 138 per cent in twenty years. Whatever may be our ideas as to the justification for this growth, it must be taken into consideration in any policy capable of practical application. The western point of view must be understood if agreement is to be reached with regard to what shall be our national reclamation policy.

Contrary to the views of some regarding western development, sane planning has for the most part taken the place of frenzied exploitation and unwise real estate ventures. Troubles which confront agriculture in the Pacific States have resulted in part from the same causes which are making it so hard for eastern farmers to carry on their enterprises with profit. Large investments in land and water development, the length of time required to bring these into fruition, and the nature of the intensive crops grown make the stabilization of agriculture most difficult, in spite of a rapid upward trend in its growth.

In the western states, as in the East, programs have been initiated during a period of prosperity that could not be continued in the period of depression which followed. Adjustment and contraction, however, are much more serious where millions of dollars have been invested in permanent crops and in development programs designed for better times. Notwithstanding a forced curtailment of development, the westerner, while fully appreciating the damage that can be wrought by an agricultural surplus, is confronted with certain specific problems and ambitions which not only conflict with eastern points of view, but

[1] Paper read at twenty-first annual meeting of the American Farm Economic Association, Cleveland, Ohio, December, 1930.

[2] Paper No. 18 Giannini Foundation of Agricultural Economics.

[3] The writer is indebted to Wells A. Hutchins of the U. S. Bureau of Public Roads, to Charles E. Stricklin, State Engineer of Oregon, and to the Washington State Department of Conservation and Development, for information used in different portions of this paper.

often with his own local interests. He is inclined to look upon the present situation as temporary and the problems which he faces as obstacles which can and must be surmounted. With youthful spirit he faces this task and dreams of a bigger and better program for the future.

It is this point of view which is often scorned by the easterner who has been inclined to doubt that there can be any beneficial results from land reclamation. Recognizing these different views, it still seems possible to select certain points upon which agreement can be reached and which might reasonably constitute a starting point for a reclamation policy.

The problems involved in reclaiming land in the Pacific States are, with few exceptions, the same as those requiring solution in other parts of the country. They lie in very diverse fields. Some of them are engineering problems, some of them pertain to technique of agricultural production; while those which are attracting the most wide spread attention today are economic problems. Such a summary as can be made here, therefore, cannot be complete and all inclusive, but must be limited to a statement of a few of the outstanding features of the salient questions confronting reclamation, particularly irrigation together with a brief account of the manner in which these are being approached in Washington, Oregon, and California.

The reclamation project from its period of organization through construction and agricultural development to that point of maturity when it begins to function in the complex economic universe exemplifies the evolution of procedure in land reclamation. From the time that irrigation first passed beyond the limits of the individual farm, questions concerning organization have occupied an important place in reclamation technique. Construction problems were next encountered and solved. No sooner had proficiency been gained in organization and construction than the difficulties of agricultural development were forced upon those who were responsible for the financial success of projects being built under their direction. Because of difficulties involved and the tardiness with which this work was undertaken, proficiency in agricultural development had not progressed so far as had skill in the arts of construction when a complete reorientation was forced upon us by the necessity of recognizing the effect of some of the broader economic tendencies upon the feasibility of reclamation projects. Not only had it become important to consider the effect of a changed agricultural situa-

tion upon the financial success of the individual reclamation project, but the question was raised as to the probable effect of reclamation development upon the agricultural surplus.

It could hardly be expected that there would be at once complete agreement as to the significance of the many manifestations of these new forces. The complexity of some of them has baffled economists, while seasoned engineers, accustomed to meeting and solving new and difficult problems, have been compelled to stand by and witness the results of work of a life time floundering or stranded on the shoals of bankruptcy by the receding tide of prosperity, which at its flood had pressed many a worthless hull into service. The wrecks of these make the task of compiling reclamation statistics a gloomy one. Moreover, the results of such compilations are of questionable value without additional information concerning the specific conditions to which they apply. A few sub-marginal projects can blur the perspective of all reclamation.

Approximately 20 per cent of the total amount of the assessment levied within California irrigation districts for the fiscal year 1929-1930, was delinquent on July 1, 1930. To flaunt this figure promiscuously, however, without further explanation would be an injustice to a large number of California districts which have continued to meet their financial obligations through one of the most trying periods of American agriculture. Some delinquency, of course, is normal. The State law permits the levy of an excess of requirements of 15 per cent to cover this. It must also be recognized that July 1 is only a few days beyond the time that the last installment of assessments becomes delinquent. It is remarkable that more have not failed in the payment of their debts. Of those which have defaulted some will recover and the bond holders will receive the principal and interest due them. In other cases it will be necessary to refinance on the basis of some compromise between land owners and bond holders. The following statement from the California State Banking Department Bulletin shows the status of delinquency in the payment of assessments in California irrigation districts:

"The assessment as equalized and levied by the Board of Directors of the eighty-three districts covering the 1929-1930 requirements, aggregated $10,361,403. The last questionnaire filed in this office, reflecting the condition of each district as of July 1, 1930, shows delinquencies aggregating $2,123,292. This report further shows that the delinquencies existing in 35 districts, with

an aggregate bonded indebtedness of $23,199,920, exceeds the 15 per cent excess levied by the board of directors. All of the districts having delinquencies in a greater amount than the excess 15 per cent levied by the board of directors had a surplus in sufficient amount to meet all their maturing obligations, with the exception of seventeen. Of the seventeen districts which are in default, five defaulted this year. Seven of the seventeen districts are in default in both principal and interest, and the remaining eleven in default as to interest payments only.'"[4] Such figures as these cause irrigation bonds to move slowly. This might appear to be desirable in the light of the present agricultural situation. If bonds were issued solely for the purpose of bringing new land under cultivation there would be no reason at the present time for any definite plan for making irrigation bonds more attractive to investors. As a matter of fact, during the next few years many of our districts will be compelled to issue bonds for refunding purposes, or to carry out construction to provide supplementary water supplies for areas already under intensive cultivation and committed by previous expenditures to a definite construction program. Farmers in California irrigation districts are now paying annually a little more than 7 million dollars for irrigation bond retirement and interest. By 1947 this will have mounted to more than 8 million if no more bonds are issued. By 1970 the cost of California irrigation district work existing at present would be almost completely amortized if maturity schedules now in effect could be carried out. If the bond maturity schedules of each district were like that of their combined sum, little refinancing would be necessary. It is imperative, however, to pave the way for refunding issues by districts having bonds maturing at rates which cannot be met by the returns from agriculture within their boundaries.

This situation raises some important questions, questions which are as difficult to answer as they are important. The problem of securing closer relationship between irrigation construction and agricultural development is just as troublesome today as it was 15 years ago when California, and the West generally, entered upon a policy of accelerating land settlement. Because of changed economic conditions and because of the trend of events, not only in the California and Washington State Land Settlements, but in private colonization enterprises as well, a

[4] Canny, D. S., Status of Irrigation District Securities, California State Banking Department Bulletin, p. 6, October, 1930.

different approach is necessary, but the problem which is still the same, is made more difficult by the new conditions.

Projects which are already constructed and which are only partially developed must either complete the development of lands within their boundaries or default on bond principal and interest. This statement is just as true in times of prosperity as in times of depression. It was the recognition of this that led to the California Land Settlement Act of 1917. Today, however, the land owner faces the dilemma of having his expenses pyramid for the want of neighbors to help him pay his irrigation costs, while at the same time he fears the probability of reduced prices that might result from an active program of land settlement. Regardless of favorable sentiment, opinion, prejudice, or policy with respect to land settlement and the fact that agricultural development in a large percentage of the western irrigation projects is only partially completed, there has been little activity in the purchase of undeveloped irrigated farms in recent years and attempts at colonization have been futile.

The present program, therefore, in all of the Pacific States involves financial readjustment. This is a forced program and cannot be called a policy. The defaulting district is reappraised and refinanced on the basis of its ability to pay. Out of this situation may grow a constructive plan designed to protect the credit of those districts which are in sound financial condition and to reestablish those which have failed, on a basis which their agriculture is able to support.

Definite progress has been made in this direction by the State Reclamation Commission of Oregon working in cooperation with the Division of Agricultural Engineering of the U. S. Bureau of Public Roads and with the Agricultural Experiment Station of the Oregon Agricultural College. The state of Oregon up to the present has guaranteed the payment of interest on irrigation district bonds valued at $9,355,850. This policy is in accordance with a constitutional amendment made in 1919 authorizing the payment by the state of interest on district bonds for a period of 5 years. The law requires that funds thus advanced for the payment of interest shall be returned to the state after the maturity of the last bond on which the state has paid interest. Only about a quarter of the amount of the bonds issued under these provisions are now in good standing and the districts on which they were issued are delinquent to the extent more than $450,000 in the payment of interest with which they were chargeable. In

the adjustments which were made necessary by this situation the State Legislature first authorized the acceptance by the State Reclamation Commission of refunding bonds on the same terms as such bonds should be accepted by other creditors, but in 1929 the Legislature went still further, authorizing the release of all or any part of such indebtedness on condition that the creditors, other than the state, agree to accept annual payments on amounts due them which the Reclamation Commission finds within the district's ability to pay. A number of Oregon irrigation districts are in the process of reorganization under this plan. So much has been written of the distressed irrigation districts in Oregon, that the opinion seems to prevail that none are successful. Of forty-three active districts in the State, thirty are paying their indebtedness regularly, and no default, other than temporary, is looked for. It is expected that the thirteen in financial difficulties will pay from 20 to 100 per cent of the principal of their indebtedness with extended maturities and lower rates of interest.

In Washington the procedure has been somewhat different from the one in Oregon, but the results have been practically the same. Just as was the case in Oregon, the year 1919 ushered in a law which was to result in forced refinancing and re-appraisal of assets. The State Reclamation Law of Washington, which is intended to promote the reclamation of land by investment by the State in irrigation, diking, and drainage bonds "recognized the fact that most reclamation projects during their development stage do not offer bankable security and assumed that the state should undertake to carry the investment in reclamation projects during this development period to give expert direction and assistance until the project is on a sound financial basis and then resell its securities, thus causing the State Reclamation Fund, in theory, to revolve."[5] At the close of 1928 bonds had been purchased by the State to the extent of $1,674,805, representing 15 districts and a little more than 90,000 acres of land. Of the amount invested, $738,000 was in default or had been compromised. Of the bonds in good standing, some of them are refunding bonds issued at a considerable loss to the State. Not only has the plan resulted in financial loss to the State, but the objectives have not been attained. "Not a single new project has been established on a firm footing."[6] Washington has also

[5] Karney, C. W., Report of the Supervisor of the Division of Reclamation P.P. in Third Biennial Report Washington Department of Conservation and Development for the Period April 1, 1925, to September 30, 1926. 1927.

[6] Karney, C. W., Op. Cit.

experimented in land settlement. Like the California settlement projects this attempt, carried on under post-war economic conditions, has had "rough sledding."

Statistics on reclamation of overflow lands are not so complete as are those for irrigation districts. It is a well-known fact that the flood control projects of the West contain large acreages of land which are not cropped intensively enough to meet the annual charges for bond retirement, interest, operation, and maintenance. It is also a fact that delinquencies and cases of default have been numerous. Emphasis should be placed upon the fact, however, that there are many flood control projects as well as irrigation districts which are in an excellent financial condition and that undue stress upon the plight of the submarginal districts may impair the credit of the majority which are in good standing.

In the light of these facts concerning the progress of reclamation in the Pacific States during the past 10 years, what can be said of the future? The period of prosperity which ended in 1920 has left us with an unusually large number of partially developed projects. Recent investigations of permissible rates of irrigation development in California[7] indicate that the area of unirrigated irrigable land within active California irrigation districts is probably in excess of the requirements for irrigated land during the next ten years. It would therefore seem that the present might be an appropriate time to organize some kind of rescue program designed to ameliorate the situation existing in projects where assessments are in excess of the ability of farmers to pay, under the prevailing conditions of incomplete project development and low net income. Various suggestions have been made to use for this purpose funds from the Bureau of Reclamation and from other sources. The plan is open to all of the arguments which can be enumerated for or against state or federal participation in reclamation.

Regardless of the means of carrying it out, such a program will include a number of the steps already mentioned, i.e., refunding of bonds where present schedules require repayment at too rapid a rate, reduced interest rates where and if possible, and re-appraisal and compromise between bond holders and land owners where necessary.

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[7] Weeks, David, Permissible Rate of Irrigation Development in California, Bul. 35 State Dept. of Public Works, Division of Water Resources, 1931.

Such programs of re-financing may make it possible to readjust assessments so as to relieve sub-marginal lands from heavy charges which tend to force them into production, and to distribute the costs on the remaining lands in such a manner that idle lands and farms under development bear nominal charges while farms under full production are at the same time protected against increased charges. In carrying out such a program there will probably arise numerous instances where purely local interests will clash with state and national points of view. There are many localities in which, at the slightest encouragement and prospects of success, land settlement programs will be actively launched. There are many cases where such programs will be to the best interests of the particular areas concerned, for once an irrigation project is brought into existence and after millions of dollars have been spent on the construction of irrigation works, success depends upon rapid change to intensive land utilization. However unwise it may have been to launch this enterprise, an investment of millions is not lost without a struggle.

There have been bitter differences of opinion as to the probable effect of such programs of development upon state and national welfare. These differences arise largely between those having their chief interest in the success of specific reclamation projects and those whose efforts are being exerted in the hope of protecting farmers in general from the evils of overexpansion of the agricultural area. These different points of view may become interregional where and when a local community, state, or a group of states has made investments of hundreds of millions of dollars in irrigated agriculture and where wholesale defalcation on irrigation bonds would seriously upset the entire financial structure of that region, or where additional capital is being sought for expenditure to carry out programs still in the process of completion.

It would seem after what has just been said that the question of new construction would not have to be raised. On the contrary there are two important reasons why new development must occupy a very important place in this discussion. In the first place powerful commercial and political influences are at work which tend to bring into being large reclamation projects regardless of their feasibility or timeliness. On the other hand there are under consideration some large developments on the Pacific Coast which might seem to justify their construction even

in the face of the present stressed conditions, but which are so broad in their scope that both negative and positive elements appear in any analysis of their economic feasibility.

Entirely aside from the question as to how these projects may affect the agricultural surplus there is little prospect for success of any new development on the Pacific Coast during at least the next 10 years which is designed primarily for the irrigation of land not now under intensive cultivation. If an attempt is made to carry out a number of the large projects of this kind which have been proposed, the only result that can be expected is the wasting of public funds, the depletion of individual fortunes, and the blighting of the lives of those who seek to develop farms within their boundaries.

In California a state-wide plan of water conservation has been under intensive investigation for a number of years which presents problems which cannot be dismissed so easily. In contrast to projects designed to bring in large areas of raw land the first unit of the California plan would be built for the purpose of supplementing the rapidly receding ground waters of an area in the southern San Joaquin Valley now farmed intensively to citrus and other orchard and vineyard fruits, alfalfa and cotton. Investigations show that if additional water is not made available within five years, thousands of acres will revert to desert. This might seem like a desirable thing to happen from some viewpoints, but the little that might be gained from the standpoint of decreased production would be paid for dearly. Millions have been invested in this area in which are many flourishing cities and miles of paved highways. If a dam could be built on one of the local streams and a simple project constructed to give this area its needed irrigation water, there is little doubt that arrangements would be made to do so. But the undeveloped water supplies are very limited in the San Joaquin Valley. The state-wide plan is the outgrowth of this and a large number of interrelated problems. Final recommendations have not been made, but temporary relief will probably be sought by the construction of storage on the upper San Joaquin River and the construction of a main canal south through Tulare County. Ultimately the plan calls for the development of one or more of several reservoir sites in the Sacramento River basin, the reversal of the flow of the San Joaquin River by a series of electric pumps and the construction of a canal to carry this pumped water to systems now possessing water rights on the San Joaquin River. In exchange

for this Sacramento River water delivered at their head gates these systems would, under the plan, release water to be diverted farther up the San Joaquin River to be carried south in the canal first mentioned. The completed project is of stupendous size and would involve expenditures in excess of a hundred million dollars. In addition to the units mentioned proposals have been made and vigorously promoted to build a 50 million dollar salt water barrier across the Carquinez Straits or at some other point, in order to control the salt water menace on the San Joaquin and Sacramento River deltas and to provide fresh water for industrial development on the shores of Suisun Bay. Alternate proposals, however, would eliminate the barrier.

The entire project would affect the interests of irrigation, flood control, navigation, mining, and industrial development. The complete consumation of the plan would make possible the doubling ultimately of California's irrigated area. The successive stages of development, however, will involve greater and greater costs so that long before all of the unirrigated irrigable land is brought under the ditch the per acre costs will be very high. The whole scheme is susceptible of being carried out in units and although there is much pressure being exerted by various interests, those investigating its feasibility are not at present urging development at a rate which is likely to upset agricultural prices. The University of California was asked to participate in the investigation of permissible costs of water and rates of development.[8] Reports on these economic aspects together with numerous reports on engineering features have been the subject of study by a commission representing state and federal interests appointed to report to the Governor and to the President upon the feasibility of the plan.

Those who have participated in the few investigations which have been made of land requirements are familiar with the high probability of error in such estimates. They are justified, however, because of their great importance. For a state the problem is more difficult than for the Nation. Population forecasts of both state and Nation are essential. There is much concern and uncertainty at the present time concerning the trend of birth rates. While specific birth rates surely have had a rapid downward trend, recent tendencies as indicated by trends estimated

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[8] Adams, F., and Huberty, Martin R., Permissible Annual Changes for Irrigation Water in Upper San Joaquin Valley, Bul. 34 State Dept. of Public Works, Division of Water Resources, 1931.
Weeks, David. Op. Cit.

for rather broad age groups undoubtedly have been influenced greatly by an abnormal reduction in the number of women at the ages of maximum fecundity. Curiously enough a large percentage of the mothers of the past five years are granddaughters of women born during the Civil War and daughters of those born during the panic of the 90's, while these post-war mothers themselves are survivors of the age groups which suffered most heavily in the influenza epidemic. Immigration for a state must be estimated indirectly. This may be done by the use of life tables and census data. Much labor is involved, the results of which may show fairly well the net immigration of the past, but because of wide variations in the interstate movements of population, the future immigration is difficult to forecast. Forecasts of the trend of fruit production for the United States can be made with a degree of satisfaction. Experience in California will illustrate the difficulties which accompany any effort for making similar estimates for a state. California now grows nearly half of the United States production of fruit whereas twenty years ago her share in the total output was about one-fourth. Reasonable estimates of the portion to be produced in the future have such a wide range of possible variation that there is room for the optimist or pessimist to make what he will of the results of statistical analyses. Similarly, efforts made in California to estimate land requirements for the dairy industry will illustrate the problems which will be met by those in other states who conscientiously try to solve the reclamation conundrum.

By producing on her own soil only those dairy products which are not easily shipped long distances, by exterminating horses entirely and by further increases in the output of butterfat per unit of feed, California could get along in 1970 with only two-thirds of her present alfalfa acreage. On the other hand, if present per capita production of dairy products is maintained, if one-fourth the present number of horses are kept and if the increase in dairy cow efficiency is assumed the same as in the first instance, there would be need in 1970 for an additional million and a half acres of alfalfa. There is little wonder that we have differences of opinion. Here, again, is not only an opportunity for the optimist and the pessimist to take their choice of figures, but there is also an opportunity for regional differences in policy. The ideal, especially from the national viewpoint, would be for California to import her dairy products if in that way they can be obtained at a lower price. But there is a tremendous gross

income involved in the production and utilization of a million and a half acres of irrigated alfalfa, most of which is spent for services, materials, and for the use of capital. The prosperity of the West has been greatly enhanced by irrigation. Too often, however, the wealth produced on irrigated land is used as a measure of the benefits derived without proper consideration of the capital used up and the labor dissipated. The public benefit from irrigation continues to be a very much confused issue. As a result there are wide differences of opinion concerning reclamation policy.

These estimates of public benefits are not confused to any greater extent, however, than are estimates of public detriment from reclamation. Well known effects of abnormally large crops on prices have erroneously been used in measuring the amount that production on irrigated land has reduced the prices of certain commodities. Qualitative or quantitative estimates of the effect of supply on price are the basis of most of the philosophy concerning the relation of reclamation to the agricultural situation. Such reasoning overlooks the fact that lands under irrigation come into production gradually, and therefore the effect of price on supply becomes just as important an economic concept to be considered as the effect of supply on price. Thus the low prices of apples may have caused certain apple-producing areas to stand still while the northwestern states increased their production. Therefore, the quantity of apples now grown under irrigation cannot be considered to have reduced the price to the same extent that prices would be increased if apples produced under irrigation were suddenly taken off the market. The ultimate effect of reclamation is to cause certain lands to be used for different purposes than they otherwise might have been, or to cause certain marginal lands not to be used at all. A certain differential in price must, of course, result, but it is not measured alone by the effect of supply on price. Inasmuch as there is much difference of opinion concerning the extent to which crops grown under irrigation compete directly with other crops, there will be little need as will be seen later to discuss further this controversial issue.

There are other fundamental questions regarding agricultural efficiency, population, and diminishing returns which have an important bearing not only on this question but the entire agricultural situation. These concepts are only vaguely understood in their relation to estimates of land requirements. In the mean-

time, until more fundamental knowledge is developed along these lines, the East and West can lock arms and not horns on the following program:

1. Construction of reclamation projects for the irrigation of land not now intensively cropped should be deferred for a decade or more in order to prevent waste of public and private capital and to protect prospective settlers from unwarranted distress.

2. Other projects designed to complete partially completed programs of construction or to provide supplemental water supplies for lands now irrigated should be scrutinized with extraordinary care in order that such projects may not be used as a leverage to promote development which may be uneconomic under the difficult agricultural conditions of the present and near future.

3. A sympathetic attitude should be maintained toward the projects which were initiated in good faith during periods of prosperity, but which find themselves now burdened with obligations they cannot meet. Each such project should be given technical assistance in the analysis of its own peculiar problems and in determining the best solution of these problems.

4. Consideration should be given to a program of refinancing and rehabilitating such projects on such a basis that the interests of those within the projects as well as the general public will be best served.

STATE POLICIES IN REGULATING LAND SETTLEMENT ACTIVITIES[1]

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The discussion of the subject of this paper has been limited to suggesting, first, certain indices of the need for more adequate land settlement regulatory measures; second, some attempts to meet the needs of the day; and, lastly, certain important aspects of a constructive land settlement policy.

With respect to the need for regulatory measures, the policy of the various states has been in the past and still is, with few exceptions, negative. Justification for this *laissez faire* policy is based in large part on the American agricultural experience generation after generation that a poor man who purchased land cheaply saw his grandsons well-to-do farmers through the mere growth of the community. Belief in this means to success is so ingrained in our American farming communities that it is counted upon even today as a market factor in a high proportion of land sales made.

A recent survey (fall of 1929-spring of 1930) of literature used by and practices of land-selling agencies having undeveloped or partly developed land for sale in different parts of the country, concretely illustrate that fact. While some of the active land settlement and colonization companies are doing constructive work of a high character, the results of our study suggest that a large number are preying on the public in general and the uninformed prospective settlers in particular. These concerns, particularly those engaged in interstate business, have developed the art of avoiding specific misrepresentation through the use of ambiguous phrases and half truths and of making skillful omission in presenting glowing accounts of profit to all who make purchases. The survey referred to above included 1,258 active land settlement and colonization companies in the United States. Almost half (46.7 per cent) of these companies were selling lands in more than one state, and slightly more than half (53.9 per cent) of those engaged in interstate business were conducting so-called homeseeker's tours.

Efforts to establish profitable farms on types of land unsuitable for farming purposes or to develop and to settle lands in irrigation, drainage, and levee districts before demand justifies

[1] Paper read at twenty-first annual meeting of the American Farm Economic Association, Cleveland, Ohio, December, 1930.

such development, result in an enormous waste of economic and human resources. Many state and other government officials, business men, and the land owners themselves are beginning to appreciate that fact. They recognize the fact that millions of acres of land now available for farming will not be in demand for agricultural purposes for many years to come, and that it is purely a business proposition to direct and regulate land settlement in the future. Financially embarrassed and defunct drainage, levee, and irrigation enterprises and abandoned farms in many parts of the country are other factors which are tending to bring the need for public guidance of land settlement to the front. Likewise the financial embarrassment of counties because of large areas of land reverting to public ownership through non-payment of taxes is resulting in supplanting the "easy going"expansion philosophy as a "cure all" with the idea of directing future settlers to the best available lands adjoining developed communities where schools, highways, and markets are already established and of discouraging attempts to develop new reclamation projects.

Although these consequences suggest a generally recognized need for more adequate land settlement regulatory measures, interviews with officials in a majority of the states and contacts via correspondence with officials in all but four of the remaining states within the past year disclose the fact that with few exceptions state legislatures have not enacted legislation to cope with these problems. In fact, 32 out of 44 states are spending public funds to attract settlers but not one of these 32 states makes a regular practice of directing settlers to areas best suited for agricultural purposes or of helping settlers get established. In the majority of states the names of prospective settlers which reach state officials are made available to real estate agencies directly or indirectly through chambers of commerce or other commercial organizations or agencies. It should be pointed out, however, that the activities of practically all states in attracting settlers have been appreciably curtailed. Elaborate exhibits at fairs and other points of interest and exhibition trains displaying crops that could only be produced under ideal farming conditions, and the distribution of posters suggesting promises of easy returns to settlers have been eliminated. This change in state policy seems to have grown out of recognition of the lack of demand for farm lands and (or) the need for more basic facts to justify an agricultural expansion program in certain areas.

Positive Attempts to Solve Land Settlement Problems

Policies to establish colonies of settlers, to certify land company, irrigation, drainage, and levee districts bonds and to provide credit at comparatively low interest rates represent the outstanding attempts by various states to solve land settlement problems since the World War. The present status of each of these policies suggests that public participation in the colonization or rural credit businesses may have a tendency to create rather than solve land settlement problems.

State Colonies

Although the experiments to establish colonies by the 5 states which had such policies differed in details, the objective in each was to develop and sell "ready made farms." The experiments are also similar in so far as results are concerned; each failed to accomplish the ends contemplated by the acts providing for them.

The total sum appropriated ($250,000) for this work by the Legislature of Arizona, has been exhausted and up to January, 1930, not one dollar has been collected from settlers (32 in all) established on "ready made farms."

The details of the California experiment with the Durham and Delhi Colonies are well known to all of you. At the date of the last available report covering the Durham Colony (November 30, 1928), 14 per cent of the land in the colony remained unsold and delinquent payments represented about one-fifth ($112,780.54) of the total due the State ($538,637.47). The Durham project, however, is considered to be less of a failure than the Delhi settlement.

Of the 8,400 acres in the Delhi Colony, 3,890 acres or 46.3 per cent remain unsold and a revaluation of property in the colony shrank the State's equity from $1,300,000 to $375,000 and the settlers' equity from $500,000 to $375,000. In June, 1930, efforts were being made to formulate a plan to adjust the $375,000 settlers' obligations to the individual properties, and thereby close the accounts of a costly experiment to the State.

The White Bluffs-Hanford Settlement of 102 farm units in the state of Washington represents another unsuccessful experiment to establish settlers on the land under public guidance. Negotiations between a Land Settlement Adjustment Board and the settlers resulted in the State giving a quit-claim deed for a consideration of $1.00 to each of all settlers but six. These tracts involved an average investment by the State of $5,700.40 per

tract, and it is only because the state officials recognize the experiment as a miserable failure that the affairs of this project are being closed out so completely.

Although the Minnesota Legislature has not repealed the act which authorizes the use of state funds to purchase, improve, and resell tracts of land to bona fide settlers, no tracts have been improved since 1923. The State has approximately $90,000 tied up in tracts which had been improved but which are now reverting to vegetative cover.

The South Dakota statute creating a Land Settlement Board in 1919 and authorizing activities of the Board was repealed in 1925, and the work of completing this chapter of experience in aiding and directing settlers was turned over to the State Rural Credit Board, the success of which in the farm loan business will be briefly reviewed later in this paper. The costly experience of this Board with authority granted it may be indicated as follows. Out of a total of 347 farms improved, 187 have reverted to the State, 10 were in process of foreclosure, 2 had been resold after foreclosure, 26 had paid up in full and 126 were still considered going concerns in April, 1930.

One other type of attempt to establish settlers on the land which might be mentioned are the so-called Veteran Bureau settlements. Veteran Bureau officials, in cooperation with various state offices, directly or indirectly promoted the settlement of land by disabled ex-soldiers awarded vocational training pay of $100 or more per month for any period up to 4 years. In addition to training pay, medical care, books, farm tools, and machinery, and all necessary farming equipment for the class of training authorized were furnished the settlers by the Veterans' Bureau. The theory of the plan was to fit all settlers for carrying on the business of farming after termination of the training period. Possibly the most complete program along this line is represented by the Veteransville, Silver Star, McGrath, and Orchard Lake Colonies in Minnesota. Mr. C. P. Hibbard, manager of the United States Veterans Bureau in this region, estimated that each colony had about 30 settlers and that at least 75 per cent of the farms were abandoned shortly after the period of training ended.

State Certification of Land Company Bonds

A law designed to provide state direction and regulation of private colonization companies through state certification of

company bonds was passed by the Wisconsin Legislature in 1913. Under this law land mortgage associations were formed, and member colonizing companies accepted mortgages on the individual farms sold to settlers. When the mortgages in any association aggregated $100,000 or more the association could deposit them with the State Treasurer who issued and sold a bond for that amount and turned the money over to the association, the object being to enable the colonizing companies to keep their funds liquid and at the same time to make "easy" loans to settlers.

In order to direct and regulate land settlement the law directed the State Commissioner of Immigration to inspect and pass on every tract offered as collateral by the associations. Like many of the laws enacted by different states to assist and direct land settlement, the Wisconsin law is commendable in theory but difficult to administer. Two associations were organized and operated under this law. The one loaned $760,280 on farms and the other loaned $444,000. No business has been transacted by either association since 1925. The first association went into the hands of receivers in 1928, and the second is trying to liquidate voluntarily.

State Certification of Irrigation, Drainage, and Levee District Bonds

One other policy of many states that has many points in its favor, as well as many weaknesses, pertains to promoting by state certification of bond issues and other measures the development of irrigation, drainage, and levee districts. Although a sort of mercantilistic philosophy based on the concept of the state as an economic entity is leading officials in certain states to consider subsidizing old projects and developing new projects regardless of the demand for or the comparative advantages of producing similar crops in other areas of the country, several states are viewing existing conditions and settlement potentialities from a broader point of view. The states of Oregon, Washington, Montana, and Texas, and possibly certain other states may be classed in this latter group. The work of the State Engineer in Oregon illustrates this new philosophy in positive form. A survey of state aided projects resulted in classifying 13 projects as feasible provided the existing indebtedness of the 13 projects representing $7,000,000 is refunded for $3,895,000. Likewise the work of the Division of Reclamation of the Department of Conservation

and Development in the state of Washington has been since 1923, not to promote the development of new projects, but to resurvey existing projects in financial distress and to recommend rehabilitation programs on the basis of a capitalized value determined in the light of actual productive capacity.

State Provisions for Liberal Rural Credit

The need for a land utilization program as the basis for formulating sound public policy with respect to land settlement is also emphasized by losses resulting from state experiments in providing liberal rural credit as a measure to assist established farmers and directly or indirectly to guide land settlement. Although there is a recognized lack of adequate rural credit, particularly for settlers in an undeveloped area, state policies designed to provide this need have, with few exceptions, failed.

Of the 12 states[2] which were or still are engaged in the farm mortgage business, the experience of the state of South Dakota in this field has probably been more costly than similar experience in any other state. Aside from loans made when foreclosed farms are resold, the Rural Credit Board has made only three loans since 1925 and the present policy of the Board is to liquidate or salvage the business. Up to April, 1930, $3,412,000 of bonds had been paid off out of a total issue of $47,500,000, and a special tax levy of $1,000,000 annually has been provided to check a growing deficit. Out of a total of 12,121 loans 2,470 have been foreclosed and 498 were in process of foreclosure in April, 1930. The Board is having difficulty selling farms obtained through foreclosure as is evident from the fact that only 122 farms have been resold since 1923, which is the date of the first foreclosure.

Although a few states are still making certain select new or renewal loans, Minnesota and Oklahoma are the only two which are still actively engaged in the farm loan business. Up to March 1, 1930, the Minnesota Department of Rural Credits had made 10,158 loans representing $46,876,400.00. At that date payments on 1,644 loans, totaling $384,508.33, were delinquent one or more times, and 1,302 farms, representing $8,271,477.04 in loans, had been taken over through foreclosure.

Some of the foreclosed farms have been improved and resold at a profit. It is the policy of the Department to get all foreclosed farms ready for sale or rental. In fact, it might be said that the

[2] Arizona, Colorado, Idaho, Minnesota, Montana, North Dakota, Oklahoma, South Dakota, Utah, Wyoming, and Wisconsin.

Department is in the farm improvement business; tractors and other farm machinery are purchased, buildings are repaired or constructed, and soil improvement is promoted through a supervised cropping system.

This brief review of outstanding policies of various states to regulate land settlement by establishing and assisting settlers does not justify a comparative analysis of the different policies. In fact, the many constructive features of different policies have been purposely submerged in order to suggest the failure of such policies to do what the acts responsible for their existence aimed to accomplish. Underlying the many reasons which might be given for the failure of such policies is the lack of coordinated effort on the part of various public offices concerned with different phases of land settlement to develop programs based on sound economic facts. One should not lose sight of the fact, however, that it has been since and not before most of the policies referred to were put in force that our immigration laws were made more restrictive, our birth rates showed a decided tendency to decline, horses were replaced by tractors on a large scale, and other remarkable changes in production technique became more or less generally practiced, foreign demand for crops at a price which would bring a profit to producers decreased and marked changes occurred in our own habits of consumption.

Needless to say, these and other related factors which undoubtedly had a decided influence on the failure of the state policies under consideration, had not been foreseen. These facts coupled with the obstacles which immediately arise when a political body attempts to promote agricultural expansion through subsidies or other artificial media, make at least a certain degree of failure inevitable. Private industry always has provided and probably always will provide for needed expansion of the agricultural area, and the past experience in this country suggests that, with the exception of special cases, the place of the Government in such an expansion program is to provide the necessary factual basis and regulatory measures to direct settlement to those areas which can be developed most economically.

Important Aspects of a Constructive Land Settlement Policy

Real Estate Licensing Laws

Real estate licensing laws, as administered in certain states, are effective land selling agency regulatory measures. The first

law of this kind was enacted by the California Legislature in 1917, since which date 26 states[3] have enacted laws to license real estate dealers.

A model state real estate license law was drafted by the General Counsel of the National Association of Real Estate Boards and, as a result of this guidance, the essential features of the law as adopted in the various states are fairly similar. Certain states require applicants for licenses to pass an educational test designed to demonstrate their fitness. To operate as a real estate dealer without securing a license is made a public offense in all states having such laws. In most states violations of any part of the Code of Business Ethics written in the law is the basis for revoking or suspending the license of the real estate broker or agent. In many states the laws are used not only to clean up the business but to protect the public from exploitation and to regulate the sale of undesirable real estate and the methods by which it may be sold. The effectiveness of these laws is suggested by the fact that under the laws licenses can be revoked and real estate dealers can be forced to return money unethically or illegally obtained from intended victims.

The California law authorizes the Commissioner to employ technically trained men to investigate any lands offered for sale for colonization or rural settlement purposes and to publish reports of such investigations. False and fraudulent statements in advertisements or publications used by the company carry a penalty of 2 years imprisonment and (or) a fine of $2,000 plus the option of revoking the real estate dealer's license. That this section of the California law can be administered effectively is suggested by the action of the Federal Grand Jury at Los Angeles on September 3, 1930, by finding the Romola Inc., a colonization company, guilty of using the United States Mails to defraud. The California Real Estate Board issued an adverse report of the activities of this company, and action was carried through the courts largely on the basis of the findings of the Board.

The limitations of regulation by competency and educational tests are yet to be defined by the Supreme Court. Although stringent educational requirements would tend to eliminate many abuses in the real estate business, particularly with respect to the sale of farm land, the courts might decide that such require-

[3] Alabama, Arizona, Arkansas, California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Iowa, Louisiana, Michigan, Montana, Nevada, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Utah, Virginia, Washington, Wisconsin, and Wyoming.

ments interfere with a man's right to follow and carry on his business and that they are unnecessary for protecting the public against fraud. Courts have already taken the strong position that it is a valid and proper exercise of the police power to protect the public from the dishonest real estate broker and it may be that in the case of land sales the courts will decide that lands may be required to measure up to a certain standard before a broker may sell them.

Blue Sky Laws

Although there is no concerted movement to get various states to adopt a "uniform blue sky law" to regulate the sale of speculative securities, such a movement is beginning to get under way. In 1929 a "Uniform Sale of Securities Act" was drafted by the National Conference of Commissioners on uniform state laws. This act was approved by the American Bar Association and copies have been made available to the various state officials concerned with the administration of security laws. It is the plan of the commissioners to alter existing blue sky laws in accordance with the provisions of the Uniform Act. With few exceptions, the old blue sky laws did not provide for regulating the sale of land regardless of the speculative nature of certain transactions. Securities to be regulated under the Uniform Act, however, include contracts, bonds or stocks used as a means for selling land on the deferred payment or installment plan and speculative securities made or issued in furtherance of the promotion of any enterprise or scheme to sell lands located outside of the state on such plans whereby the value of the securities depends on the future stipulation by the promoters of the enterprise to furnish irrigation, drainage or transportation facilities, or other value enhancing utilities or improvements. A law which embodies features such as those mentioned above will go far toward prohibiting or regulating "farm it by proxy" projects, and other projects which are found to be unsound but not necessarily fraudulent.

There is little question but that real estate license and blue sky laws have very essential parts to play in any constructive land settlement program. The effectiveness of such laws in directing land settlement is limited, however, first, because of the difficulty of regulating the activities of land-selling agencies engaged in interstate business, and, second, because of the lack of basic facts as to the economic use of land resources for agricultural or other purposes. Even assuming that basic facts

as to the economic potentialities of land were available, no state law could prohibit predatory land-selling agencies from transacting business en route between states.

Regulation of Interstate Activities

In order to make a sale of land to a person living outside the jurisdiction in which the land is located, it is necessary to communicate with the probable purchaser via post office facilities and (or) the facilities of interstate commerce (telegraph, telephone, transportation, etc.). Since these media are under the regulatory control of the Federal Government, the Federal Government has control of the machinery and channels through which the transactions must be consummated. Section 215 of the Criminal Code of the United States provides for preventing the use of the mails for fraudulent purposes. Lack of basic facts relative to the economic use and potentialities of land, however, definitely handicaps enforcement of the spirit of the law in so far as land sales are concerned. For the most part, predatory land-selling agencies make a practice of avoiding specific misrepresentation and "mere puffings and exaggerations carried through the mail are not within the prohibitions of the statute, but when a proposed seller goes beyond magnifying his opinion of the advantages which the land may have by inventing advantages and falsely asserting their existence, he transcends the limits of puffing and engages in false representations and pretences which the statute denounces."[4]

The United States Supreme Court (Hoke *vs.* U.S. reported in 227 U.S. p. 320) interpreted the powers of Congress to regulate interstate commerce as direct and without limitations. The Court stated that Congress may adopt means necessary and convenient to regulate interstate commerce and that these means may have the quality of police regulation. Thus far Congress has not passed legislation to regulate the sale of land under the authority quoted above. Although Congress could enact legislation to compel all concerns using the facilities of interstate commerce to operate subject to a federal license to be issued only after the methods of operating have been subjected to careful scrutiny by federal and state officials, it is probably inadvisable to enact such more or less distasteful legislation.

Uniform real estate license and blue sky laws in each state, together with the existing postal laws, are adequate regulatory

[4] U. S. *vs.* New South Farm and Home Co., 241 U.S. 64.

measures provided they are administered in the light of facts necessary to formulate rural planning programs. The effectiveness of rural planning programs, however, is in large part dependent upon coordinating the activities of administrators of such laws with the activities of agricultural experiment stations, extension workers and other public offices concerned with the sound development of the national resources of the country. The lack of such coordination results in duplicating and in many states counteracting efforts of public officials. Furthermore under existing conditions, the regulatory laws mentioned are made effective in only the outstandingly fraudulent practices of land-selling agencies brought to the attention of the administrators of the laws. A rural planning commission or a land utilization commission in each state authorized and directed, first, to coordinate the activities "of the various public offices which in one way or another effect the use of land; and second, to cooperate with a similar federal commission is suggested as a fundamental part of a soundly directed land settlement program.

To establish a rural planning program in any area or region requires a careful study of the economic advantages and disadvantages of using land for farming, forestry, recreation, grazing or other purposes. Through the cooperation of county, state, and federal authorities in the conduct of such a study a well defined public attitude toward certain types of land in different areas or regions would be developed. Centralized public service and publicity forces could be established for the purpose of disseminating the results of the studies made and for influencing the course of land utilization.

Briefly, rural planning programs worked out through the cooperation of federal, state, and county agencies would result in a more economical utilization of land resources. They would facilitate the elimination of unjustifiable school, highway and other local government costs and the social loss resulting from scattered settlement on sub-marginal and marginal lands; they would help legitimate land settlement and colonization companies conduct their businesses in accordance with sound economic facts; they would make possible the establishment of valuable forest and game districts on lands which today are not used productively for any purpose; and last, but by far not least important, they would provide the factual basis necessary to administer real estate, blue sky, and postal laws effectively.

A SOCIAL AND ECONOMIC PROGRAM FOR SUB-MARGINAL AGRICULTURAL AREAS[1]

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In submitting a social and economic program for the sub-marginal agricultural areas, it is best to confine the discussion to a specific region, namely, the cut-over lands of the Lake States, and even narrow it down to Wisconsin. After all, a program must fit a particular case with its own physical, economic, social, and even legal background.

Geographically the cut-over area of the Lake States is largely a part of the Laurentian Plateau and shares with it many of its peculiarities of soil, topography and climate.[2] The soils are extremely varied, glaciated, with many lakes and swamps. In some sections the growing season is less than 110 days. In spite of excellent transportation, good markets, and proximity to large urban centers, agricultural development has absorbed less than one-fourth of the land area of the seventeen northern counties of Wisconsin which are the chief cut-over counties of this state. In explantation it has been said that settlers passed by the wooded districts of the three Lake States for the prairies, and even thousands of Wisconsin people left the state "forgetful or ignorant of the good farming lands close at home."[3] Probably the best years of agricultural development were from 1910 to 1920 when land was cleared at the rate of 20,000 acres per year. We dreamed of a great dairy empire in Cloverland, and the prediction was made that northern Wisconsin would some day feed the nation. The agricultural depression has brought us back to earth.

An inventory of the land utilization of this region reveals (1) scattered communities of farmers on good land. The whole region is not sub-marginal agriculturally. (2) Small tracts of merchantable timber, of considerable importance in some counties but practically negligible in others. (3) Recreational land—that is, land used by summer houses, resorts, clubs and camps. This type of land is not important from the standpoint of area but very important as a part of the tax base.

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[1] Paper read at joint meeting of the American Farm Economic Association and the American Sociological Association, Cleveland, Ohio, December, 1930.

[2] Mackintosh, W. A., "The Laurentian Plateau in Canadian Economic Development," Economic Geography, October, 1926.

[3] Henry, W. A., Northern Wisconsin. "A Handbook for the Homeseeker." Madison, 1896, pp. 14-16.

These three utilizations are producing an income, in other words actually can yield economic rent, can pay taxes, and in general their owners do so. These lands form the effective part of the tax base, together with the cities and villages, the mines, water power, etc., not in cities.

In addition to the lands which make up the effective tax base there are (1) areas of good farm land not yet developed but now cut-over with some second growth, (2) large areas of sub-marginal cut-over land, with second growth. These include swampy, rough, stony, sandy soils and all lands where the cost of reclamation is prohibitive. The sub-marginality of some of these lands has been generally recognized. It was estimated over 30 years ago that almost 40 per cent of the land of northern Wisconsin was not suited to agriculture and should remain in forests.[4] Taxes have been paid on these two types of land for 30 years or more by land companies and so-called "speculators" with the hope of recouping taxes and carrying costs in the sale of the land. Trusting in Ricardo, Malthus, and James J. Hill that there was only one crop of land and soon a land hungry mob would gladly buy it, they now find no sale for the cut-overs and are dropping them for taxes. In view of the fact that at the most rapid rate of settlement the northern counties ever enjoyed it would take over a century to get the best lands into farms, it must be evident that tax delinquency was inevitable, depression or no depression. No set of owners could afford to hold land for 100 years waiting for customers. However, the owners of cut-over lands, in paying taxes for over a quarter of a century, have contributed materially to the support of schools, roads, and local governments. Now they are contributing the land itself to the county.

One reason for the hope of converting all the land into farms is that the test of sub-marginality is such a vague and elastic one. Soils which an American would call worthless are cleared by Slavs and Finns. In fact, it was even said that no one but foreigners would clear the raw lands on the frontiers.[5] Local boosters were always ready to sacrifice man for the land instead of considering that land should exist for man. Ricardo's definition of the margin is far too simple. Sociological as well as economic research is necessary to settle this question.

Lastly are the abandoned farms, deserted, in part, because the

[4] Roth, Filibert, "Forestry Conditions of Northern Wisconsin." Wisconsin Geological and Natural History Survey, Bul. No. 1, p. 8.
[5] Speek, Peter A., "A Stake in the Land," Harper's, 1921. p. 8.

land was sub-marginal, and partly because of the farmer himself. In the last ten years the depression was most disastrous for the settler who was caught in the "grub stake" stage of his agricultural career. These are the lands going delinquent most frequently; not many acres are being redeemed nor are the tax certificates being purchased by private owners to any extent. They are now reverting to public ownership.

The abandoned farms, the cut-overs, now unused or sub-marginal, and all land in public ownership form the ineffective part of the tax base.[6] The state, the counties, and even some of the towns have a mixture of all or some of these six classes of land. Some towns are so unfortunate as to have mostly cut-over land or abandoned farms within their boundaries.[7] Practically all of the governmental units have to wrestle with the problem of unused, sub-marginal or abandoned land.

Part of this problem is the shrinking tax base through decrease in the area of valuable timber and of active farm land. There is also a shrinkage in the value of land itself. Farm land all over the United States has declined in value and the cut-overs declined even more as the market for raw land declined and the supply of partly improved abandoned farms increased. A drastic reduction in revenues came when land began to go delinquent. In 1927 the seventeen northern counties failed to collect taxes on some 3,000,000 acres, or 25 per cent of the total land area. Assessments on unused lands were reduced in some counties with the hope of keeping them on the tax roll, but this also tended to reduce total revenues. As the process went on the burden was shifted to the cities and villages, the timber, farms and resorts. The augmented burdens on the remaining farms in itself tended to increase delinquency.[8]

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[6] The relationship of ownership, utilization and tax delinquency is shown by the following figures taken from the Bayfield County study.

	Per Cent of Area of County	*Per Cent Delinquent—1926*
1. "Effective Tax Base"		
Farms	19.0	10
Vacant Farms	1.0	13
Recreational Land	2.5	8
Wood using Industries	7.9	1–10
Urban and Urbanized Land	1.9	—
2. "Ineffective Tax Base"		
Abandoned Farms	4.3	35.5
Speculator-owned Land	35.0	35
Land Companies' Land	18.7	27
Mortgage, Investment Companies, etc.	.8	60
Public Lands	6.9	—

[7] As for instance the town of Wilson in Lincoln County. See "Use and Taxation of Land in Lincoln County, Wisconsin," by B. H. Hibbard, W. A. Hartman, and W. N. Sparhawk. Wisconsin Agricultural Experiment Station Bulletin 406. pp. 8-19.

[8] Hibbard, B. H., and others, "Tax Delinquency in Northern Wisconsin." Wis. Agricultural Experiment Station Bulletin 399. 1928.

The northern counties are faced with a shrinking tax base on the one hand and by increased costs of government on the other. More is being asked of our counties—nurses, mothers' pensions, and other forms of social work. Roads have made insatiable demands upon public funds, especially in a new country where the direction of settlement and development is often determined by transportation. Schools are established and maintained at high costs per pupil because it is the only way by which education can be given children in sparsely settled areas under the present system. Schools with an annual cost of over $500 per child have been found. Part of the present burden is due to the fact that community enterprises were projected under dynamic conditions with future agricultural development in mind. Schools and other public works were constructed in the period of prosperity and the bonds are coming due in the period of depression.

Furthermore, the public costs in connection with land tend to remain constant whether it is productive or non-productive. Roads have to be built through it, services, such as rural free delivery, maintained, and the lands must be policed. Fire protection is more urgent than if the area were in farms or forests. Even if the idle land is not worth saving, the farms, resorts, villages, and standing timber on adjacent land must be protected.

And it should be emphasized further, that lands sub-marginal for private utilization inevitably remain or become public property. Refusing to take title to land continually tax delinquent does not change the economic status of the land. It yields no income in either case, cannot pay taxes, vanishes from the tax roll, and fails to pay even the costs enumerated above which originate on its own particular area.

In a region where recession has replaced progression many social problems arise. The spirit of the people is different where there are stagnating churches, schools, and other social institutions. In Canada there has been an attempt to settle the Laurentian Plateau for over 75 years. It is claimed that an inverse natural selection has left behind the shiftless and incompetent elements of the population and "the growing isolation has brought social conditions which make the territory a notorious slum."[9] Northern Wisconsin does not have a general recession of settlement; some places have made progress, others have not. Since the region is not entirely agricultural its fortunes are not in "one bottom trusted." There seems to be no evidence that

[9] Economic Geography, op. cit. p. 541.

similar inverse selection has taken place, but there is great need for sociological research and study in this field.

Any program for the so-called sub-marginal areas should have for its object the productive utilization of the land. As in the parable, there is land with ten talents of productivity and land with but one talent, but all of it should be put to work according to its capacity for productivity. All land not needed for agriculture and all land suitable for private commercial reforestation should be reforested by private enterprise. The remainder, being unsuited for private utilization, will be publicly owned and should be used for public forestry. The Lake States once grew as fine a forest as was to be found anywhere in the eastern United States, and can do so again if given the opportunity. In fact, there is considerable second growth now. As forest land it will be income-producing land by furnishing wood products, restoring and maintaining local industries, by enhancing the recreational value of the area and by reducing the present costs of fire protection. Besides, there will be indirect benefits such as watershed protection and the regulation of stream flow.

The first task, then, is the reforestation of all the land *not needed* for agriculture. This will be less than the area *suitable* for farming, but if the population curve should take a sudden turn upward it is easy enough to convert any forest land into farms, but it is the work of generations to reverse the process. Private enterprise has begun this work under the Wisconsin Forest Crop Law, which assures to the forest owner a stable and rational system of taxation. Owners entering land under this law pay 10 cents an acre during the rotation period, payable to the town treasurer, and 10 per cent of the value of the stumpage at the time of cutting, payable to the state. In order to assure sufficient local revenue, the state pays an additional 10 cents to the towns. Under this law 300,000 acres have already been entered. Public forests, however, are necessary to complete the program.

The second task should be the further development of recreational land. The three Lake States are the summer playground for the people of the Mississippi Valley. They have in their lakes, streams, the Great Lakes and wooded areas an immensely valuable resource. According to the traffic counts of the Wisconsin State Highway Commission, four and a half million visitors entered Wisconsin by car during the tourist season of 1929, almost 60 per cent of whom reported that they were coming into

the state for fishing, vacations, and to enjoy the scenery. It is estimated that they spent over $134,000,000 while in the state, of which one million was for the gas tax alone. The Michigan figures exceed these, and Minnesota, with her 10,000 lakes, stands equally high in this respect. A program of development of this resource will include better transport facilities, reforestation to enhance the scenic value of the Northland, and proper local taxation policies to avoid fleecing the summer home owners and the owners of other recreational land. To this should be added a comprehensive program of national and state parks, game refuges, public hunting and fishing grounds. The more the North is developed for private recreation the greater is the danger that the land around the choicest lakes, streams and scenic spots will become private property and thus be closed to the public. We need *public* lands for recreational use. One of the requirements of the Forest Crop Law of Wisconsin is that the public cannot be denied the right to hunt on such lands. The program of the Wisconsin Conservation Commission includes the policies which have been mentioned. The Commission is also wrestling with the problem of securing public hunting on farm and forest land in others parts of the state.

No stimulation of agricultural settlement is contemplated, but there are indications that the depression in urban centers has started a slight "back to the farm" movement. Such settlers should be encouraged to rehabilitate the partly improved farms on good land in or near established communities. In this way land will be restored to the tax roll with no additional demands for roads and schools. There have been a few cases where isolated farmers were induced to exchange their farms for county owned lands in settled areas and the moving expenses borne by the county. However, these cases are so few that one cannot speak of any movement or program in this direction. There is no doubt, however, that if all scattered farmers could be induced to move in this way and schools and roads no longer needed were abandoned, substantial savings in public expenditures could be made. Further legislation, perhaps, will be needed to enable counties to do this in a wholesale manner.

Since sub-marginal and unused lands become tax delinquent and finally revert to the county or state, public action is inevitable whether we want it or not. Some method must be adopted in dealing with county or state owned lands, some policy laid down as to the handling of the tax delinquent lands that

threaten to become public property, in fact something should be done to prevent privately owned lands from becoming delinquent in the first place.

Since the county is the unit of government most vitally affected under the peculiar governmental "set-up" in Wisconsin, a large share of the immediate public action falls upon county officials. It is desirable, though not absolutely necessary, that such action should be preceded by a physical and economic survey of the county. In Wisconsin it is the policy of the State to make such a survey at the request of the county board. Various state and university departments cooperate in making the study. The Extension Service of the College of Agriculture acts as the clearing house and directing agency, and the material is published as a special circular of this service. The principal contributors to our last bulletin were the County Agent, the Departments of Agricultural Economics and of Soils at the College, the Conservation Commission, the Department of Agriculture and Markets, and the Department of Public Instruction from the Capitol, and the Geological and Natural History Survey. The bulletin presents an inventory of the soils, forests and other natural resources, a survey of the agriculture, recreation and other industries, roads and schools, and an analysis of the county finances. These surveys do not involve detailed soil and forest cover surveys as, for instance, the Michigan Land Economic Survey or the Bayfield County Land Economic Inventory made in 1927-29 in Wisconsin, but the economic data are perhaps more complete and aimed at the one objective of giving the County Board the necessary facts for public action. Every bulletin closes with a number of suggestions worked out in cooperation with the County Agent and sometimes with the County Agricultural Committee. Part of the program outlined in this paper is based upon the recommendations in these county survey circulars.[10]

It is urged upon the counties to take title to all tax delinquent lands as soon as they can. This takes the land off the tax roll, and for this reason county boards are loathe to do so, hoping that by some miracle the owner will redeem the land, or that a private purchaser of tax certificates will appear. However, because of the peculiar position which the county occupies in the

[10] Three of these have been published—"Making the Most of Marinette County Land," "Making the Most of Taylor County Land," and "Making the Most of Ashland County Land." Two more are about ready for the press. The series will carry uniform titles, and when completed will form an atlas of northern Wisconsin.

Wisconsin system of government, the county is usually better off financially if it does take title.

After the county owns the land, there should be a definite policy of dealing with it. As yet there is no uniformity of procedure. One county is trying to get the lands back to the tax roll by a sort of homestead policy, offering the lands if the back taxes are paid, and if certain requirements of settlement and clearing are complied with. A deferred payment plan is also part of the scheme. All of the counties have resold some of their lands to established farmers who wished to enlarge their holdings, which is to be commended. In some cases individuals have bought county lands just to strip off the second growth timber, and the land is again tax delinquent.

It is recommended that the county enter its lands under the Forest Crop Law, which is permitted by an amendment to the law passed in 1929. The state will pay the 10 cents to the town just as in the case of private entry. In this way, the land is brought back as tax paying property and put to a productive use. Counties are permitted to exchange land which enables them to block up their forests. Just recently one of the counties, in fact, the first one where one of the surveys was made, has established four county forests, embracing 158,900 acres, of which the county already owns 55½ per cent and will own more after exchanges have been made. This county has also taken another commendable step in appointing its surveyor as its "land man," and giving him charge of the county-owned areas.[11]

In addition to the county forests, federal and state forests are being established. The federal government plans to purchase one million acres in Wisconsin, and funds are now coming in from a 1/20 mill tax for state reforestation. One of the reasons for the prompt taking of title to tax delinquent lands by counties is that the transfer and sale to Uncle Sam is very simple, and the money goes into the county treasury. School forests have also been created, which are of particular educational value in getting the people forest minded, and giving some knowledge of forestry to the young folks. It has also been suggested that the present system of state and federal aid be extended to counties to help them in building up their forests.

In 1929 a law was passed permitting counties to apply the principles of zoning to rural areas.[12] County boards were given the

[11] Biennial Report of the State Conservation Commission of Wisconsin (1929-30) pp. 30-32.
[12] Chapter 356, Laws of 1929.

power to "regulate, restrict and determine the areas within which agriculture, forestry and recreation may be conducted, the location of roads, schools and industries. . . ." This law is so new that it has not been tried out by county board ordinance, as far as I know. The same legislature also made it clear that town boards have the right to refuse to build a road if they feel that such a road is not needed. Under the old law it was considered compulsory whenever a settler called for a road. This power is in itself an important zoning act. As a matter of fact, county officials have unconsciously acted in accordance with a zoning program by discouraging scattered settlement and promoting recreation. By taking title to the delinquent land they are in the best possible position to manage and direct the utilization of these lands in accordance with a zoning program.

However, the possibilities of rural zoning are intriguing. With the land economic surveys to guide them, county boards can determine the agricultural, forest, and recreational areas. Schools, roads, and even towns can be laid out or revamped to suit these districts.

So far the program has dealt with the problem of utilizing the land, restoring it to the tax roll, and its management under public ownership. The remainder of the plan has to do with economies in administration and local government. In Wisconsin legislation is needed that will change the relation of the county to the towns and the state. It has many burdens now and bears the brunt of tax delinquency. Since this is a problem not of general interest, it will merely be mentioned here. Similarily the general need of revising the system of taxation should be emphasized.

There should be a more economical system of education for the rural schools with no diminution in efficiency. There are too many small school districts with a multiplicity of officials. One of the northern counties has one school board member for every seven and one teacher for every 12 pupils. But the same condition exists in older counties where schools were established in the horse and buggy days. The county unit school system has strong support in Wisconsin. Further extension of state aids is also suggested, and consolidations wherever efficiency can be obtained with the same costs.

There should be greater economy in town and county governments. Examples can be cited to show that part of the heavy local tax burden is due to poor administration and extravagance.

But we need to go a step further. There should be consolidation of towns and even counties. Just before Christmas the press reported a proposal to combine three of the northwestern counties of the state. Counties and towns were laid out under dynamic conditions with the hope that population would come, or because of petty quarrels, or to suit the needs of people when they had poor roads and inadequate means of travel. If these units of government could be laid out from the standpoint of a sufficient tax base, strong enough to carry the burdens of modern government, they would be satisfactory. It has recently been suggested that towns should be abolished entirely. However, we must not over-emphasize the savings expected from the elimination of towns and counties. The heaviest tax items, the schools and roads, must be provided for a given density of population no matter whether the people reside in one county or two. Of course, there will be savings in administration and overhead. More research into county finances will be needed before we can safely predict just how much our tax burden will be decreased by the elimination of a certain number of local governments.

In conclusion, a broad program for regions with considerable sub-marginal land would include (1) bringing the land into a productive use under private or public ownership, (2) restoration of the land to the tax roll, or management by public bodies to secure revenue if possible, (3) additional aids for schools, roads, and reforestation from the state and federal governments, (4) economies in local governments by the county unit school system and in the reorganization of town and county governments.

THE NEW AGRICULTURAL POLICY OF SOVIET RUSSIA[1]

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As we understand the new agricultural policy of Soviet Russia, it is the policy accepted by the communist party of Russia and put into effect after the fifteenth congress of the party in the winter 1927-28. Its purpose is to replace the small peasant farms by large-scale agricultural enterprises such as large state farms—sovkhoz—or cooperative farms, organized in a somewhat different manner, the so-called kolkhoz. During the last two years, 1929 and 1930, this policy has been put into effect with great vigor. In order to understand the reasons for this new policy, and the methods of its execution, it is necessary to give a short review of the agricultural policy of Soviet Russia beginning with 1917. To a certain degree the new agricultural policy of Soviet Russia is a return to the principles which dominated the agricultural policy of the Soviet government during the period of so-called war- or militant communism, from 1919 to 1921.

The Russian communist party, or the bolshevist group of the Russian social-democratic party, has always been a partisan of large-scale farming. It has always declared that in agriculture as well as in manufacturing large-scale enterprises have a competitive advantage over small ones and tend to supplant them. It does not recognize the existence of a special form of evolution in agriculture, different from that of industry.

However, the communist party, being a partisan of large-scale agricultural enterprise and not admitting any advantage in small farming, was, at the same time, quite conscious of the great popularity among Russian peasants of the idea of a subdivision of large estates and of a leveling of land holdings. Accordingly, in its struggle for power during the first steps of the revolution the communist party, in order to get the support of the peasantry, accepted an agricultural policy which was not of its own making and did not correspond to its principles. In fact, the leaders of the left wing of the socialist-revolutionary party, with whom the communists had united their forces during the first steps of the communist revolution, were even permitted to formulate the first agricultural policy and to prepare the first agrarian law (the law of February 19, 1918).

[1] Paper read at the joint meeting of the American Farm Economic Association and the American Statistical Association at Cleveland, Ohio, December, 1930.

The chief aim of this law was to create equalization in the use of land. It proclaimed that all ownership in land was abolished and that the land was transferred, for use, to all the working people; that all land was to be distributed on the principle of equalized land possession; and that *every* citizen in principle acquired the right to use the land. Thus the reform embraced not only the confiscated estates but the land of the peasants as well; "socialization" was to level all the existing inequalities of land possession.

The peasantry in its revolutionary activity did not follow exactly the principle of a thorough equalization of land through all the country but a considerable leveling of land holdings within narrower boundaries took place. Large estates were taken and subdivided, including all belonging to them—buildings, inventories, livestock, etc. The "surplus" lands from individual farms of wealthier peasants were also cut off and subdivided. But what is of greatest importance, all large-scale agricultural enterprises and even middle-sized farms, disappeared. In the entire country there was left in the hands of the Soviet government not more than two or three per cent of the arable and pasture lands. The land fell into the individual possession of the local population. But in spite of the extensive subdivision of large estates, the average size of peasant holdings did not increase appreciably. Many landless peasant householders obtained lands; even many city workers returning to the country obtained land; although the process of subdividing the larger peasant households proceeded very rapidly, the number of peasant householders increased likewise.

Such were the conditions when, early in 1919, the Soviet government, after the rupture with the left wing of the socialist-revolutionary party, tried to formulate its agricultural policy more nearly in accord with the principles of the communist party. The decree of February 14, 1919, declared the principles of the "socialistic organization of agricultural production." All land was proclaimed "a single state fund"; "all forms of individual land possession" were declared "to be dying out"; "big soviet farms, communes, communal land cultivation, and other forms of associated farming" were pronounced to be "the best means toward organizing a farming system on socialist lines." According to this decree, the land reserve is to be used in the first place, for satisfying the needs of the soviet farms and communes; in the second place, for satisfying the needs of artels,

associations and other collective farm units. Individual cultivators, desiring land as a means of subsistence, occupy only third place.

In this way the policy of preference of state farms and of collective farms was proclaimed by the Soviet government as early as the beginning of 1919. But at that time this policy could not be applied. As was mentioned above the Soviet government by this time held really only from two to three per cent of the arable land and pasture land, only the remnants of the former large estates, which had been to a great degree subdivided by the peasantry. The Soviet government could utilize for the organization of large state farms only these remnants of former large estates. Likewise the "communes" (collective farms) were organized mostly on the land previously belonging to large estates. The peasants at this time were unwilling to depart from lands which they had taken from large estates or to organize their own farming on collective lines.

The attempts of the Soviet government to retain from ten to twelve million acres of land taken from large estates connected with sugar factories already nationalized by the Soviet government, and to organize on these lands large state farms for the production of sugar beets was unsuccessful. It succeeded in keeping only two or three million acres, the rest being held by the peasantry in small lots.

Thus the first attempt to organize a large farming enterprise in the form of state farms or collective farms was unsuccessful. Only a small percentage of the agricultural area, not more than 2 per cent of the total tillable land, was held by state farms and by communes, and even these few large farms were not successful. This is recognized even by official historians of the Soviet agricultural policy. One of them, Mr. Swidersky, in the article written in connection with the tenth anniversary of the Soviet government[2] says that from four to five thousand state farms containing about five million acres and located in all provinces of Soviet Russia, could not produce sufficient food even for their personnel and for their livestock. They rented more than half of their land to peasants.[3] After the introduction of the new economic policy (NEP) in 1921, many of these state farms were abandoned because they could not continue without financial help

[2] Swidersky, A. T., Agricultural policy over a period of 10 years. "Puti Selskogo Khoziaistva," official periodical of the Commissariat of Agriculture, 1927, N 10, pp. 18-49.

[3] Which shows that small-scale peasant farming at that time was more efficient than farming in large state farms.

from the state whereas the policy of the state was to keep them on a self-supporting basis.

The collective farms of this period were not much more successful in spite of the fact that they obtained buildings and part of their livestock and inventories by confiscating them from large estates. By May of 1921 there were about fourteen thousand such collective farms with about three and a half million acres of land. During the period from 1921 to 1926 the number of collective farms and their agricultural area decreased rather than increased. At the beginning of 1927 official statistics estimated the number of collective farms at from fourteen to fifteen thousand and the land involved at from five to six million acres but with only 1,700,000 acres of crops, while the total crop area of the country was estimated at 280,000,000 acres. That is, collective farms produced a little more than a half of 1 per cent of the total crops. Together with state farms they accounted for only a little more than 1 per cent of the total crop area of the country.

Thus during that period of revolution the Soviet government was quite unsuccessful with its first experiments in large-scale farming. As it was several times officially stated, state farms were too far from the ideal to serve as examples of efficient and rationally organized farming for the neighboring peasantry. They could not produce for the government even a small part of the food necessary for city population. The government was obliged to confiscate all the food necessary for the city population from the small peasant farms. It is known that this policy of confiscating all the agricultural surpluses of the peasants was in a large measure responsible for the complete disorganization of agricultural production during the first period of the Russian revolution. It is not the purpose of this paper to discuss the agricultural policy of that period.

In 1921 the Soviet government was obliged to proclaim a new economic policy which was, likewise, a new agricultural policy. The prospect of an immediate socialistic organization of agriculture was abandoned. The Soviet government decided to leave more freedom of initiative to the peasants. The policy of confiscating all surpluses of agricultural products was replaced by fixed taxation of the peasants in kind. The market for agricultural surpluses was reopened. The purpose of the government was to stimulate the development of the productive activity of small- and medium-sized peasant farms, to increase their production beyond their needs for consumption, and to solve the food

problem for the city population in this way. The best exposition of the agricultural policy of the period of NEP is probably the Land Code of 1922.

After proclaiming solemnly the principle of nationalization of land and the abolition of private rights to land, the Code of 1922 recognized practically unlimited tenure, in time, for agricultural use by the actual holders of the land. The Code did not impose on the peasantry new forms of land tenancy; on the contrary, it recognized the equality of all previously existing forms: the community of land, the individual holdings in open fields, and the holdings in closed fields (khutor or otrub). The Land Code, in abolishing private rights to land, without doubt did not permit such transactions as the purchase and sale, or mortgaging of land, but peasant's lands in Russia could not be freely sold or mortgaged even in pre-revolutionary times. Only after the agrarian reform of 1907 (Stolypin's reform) was it possible to establish full private property rights on allotted peasant lands. However, the Land Code of 1922 permitted the leasing of agricultural lands, though with certain limitations. It also permitted the use of hired labor in agriculture, which had been excluded by previous laws of the Soviet government. A few years later, in 1925, the Soviet government allowed even more freedom for leases of agricultural land: it permitted leases of twelve years' duration (even longer—two rotation periods if they were longer than six years). It also permitted rented land to be worked with hired labor. This had been forbidden by previous Soviet legislation and, without doubt, prevented the renting of land by the well-to-do peasantry. The use of hired labor in agriculture was still more facilitated by the temporary regulations of 1925 concerning hired labor on peasant farms, for agriculture was permitted several exceptions from the regulations of the laws protecting hired labor, which are very severe in Russia. Agriculture, for instance, was permitted a longer working day—longer than eight hours.

It appears, then, that the policy of the Soviet government from 1922 to 1925 was to give some concessions to the peasantry, to conciliate the peasantry as a whole and to stimulate their productive activity. The food supply policy of the government was based on the production of small- or medium-sized peasant farms and it should be recognized that this agricultural policy was to a certain degree successful. During the period 1922-26 the Russian peasantry made a great effort to equal the pre-war and pre-

revolutionary agricultural production. In 1922, the year of the greatest decline in agricultural production in Soviet Russia, the total crop area was only about 60 per cent of the pre-war area; in 1926 the total crop area of Soviet Russia was not very far below the pre-war level.[4] That is, peasant agricultural production during the five year period increased about 50 per cent.

However, this policy of conciliating the peasantry did not continue long. The Soviet government clearly understood that in order to increase the quantity of marketable agricultural goods it had to favor well-to-do peasants, because only this group of peasants produced a considerable surplus of goods. A middle peasant produced for market a comparatively smaller percentage of his gross product and a poor peasant had practically no surplus. In order to have a sufficiently large surplus of agricultural products, large enough to cover the needs of the city population and to permit exports, the Soviet government had to favor the stronger farmer. But this was contrary to the political interests of the communist party and to its communistic scheme. The communist party considered the wealthier peasants as class enemies and that it had to fight against them to prevent their further growth and to keep them from power.

This conflict between the necessity of developing the productive forces of agriculture on the one hand and the communist policy on the other hand, caused continual vacillation in the agricultural policy of the Soviet government. The Soviet Government after 1922 made considerable effort to increase the productivity of agriculture, to supply the peasantry with agricultural machinery, to develop agronomic assistance, and to organize agricultural credit. On the other hand its taxation policy was more and more directed against the well-to-do peasant. The progression of agricultural taxes became so great that it prevented the increase in the size of farms and encouraged their subdivision into smaller units, which was detrimental to an increase in the productivity of agriculture.

The communist party became suspicious of well-to-do peasantry at a very early date. First there began the anti-kulak policy of the so-called "opposition" in the communist party (the group headed by Trotsky). This group demanded that the possi-

[4] The estimate of the total crop area of the U.S.S.R. by the State Planning Committee (Gosplan) is, for 1926, 98.3 per cent if 1913 equals 100 per cent. More cautious estimates by N. P. Oganovsky, an authority on agricultural statistics in Soviet Russia, put this percentage at 94.3 per cent, letting 1913 equal 100. See article, "Decline, Recovery and Reconstruction of Agriculture during 10 Years," Ekonomicheskoe Obozrenie, 1927, No. 10, pp. 55-72.

bilities for growth of power of the well-to-do peasantry be limited. With this in mind, the opposition insisted upon decreasing agricultural prices in proportion to industrial prices so that a rapid industrialization of the country would be effected. At the same time the economic growth of the well-to-do peasants who were the principal sellers of agricultural surpluses would be retarded. The ruling group of the communist party did not oppose such a policy very long.

The low ratio of agricultural to industrial prices was perhaps more characteristic of Soviet Russia after the war than of any other country. The recovery of agriculture after 1922, thanks to the initiative of the peasants, was more rapid during the early part of this period than that of manufacturing which was controlled by the government. When later, industry had recovered its quantity production, it was not able to lower the cost of production sufficiently. As a result, the ratio of agricultural to industrial prices was always to the disadvantage of agriculture. Yet the intent of the Soviet governent was to keep this ratio on a low level.

Even the ratio of wholesale indexes of agricultural to industrial prices shows agriculture at a disadvantage.

RATIOS OF THE INDEX OF WHOLESALE AGRICULTURAL PRICES TO THE INDEX OF WHOLESALE INDUSTRIAL PRICES

	1913 equals 100
1922-23	52.4
1923-24	62.2
1924-25	86.7
1925-26	85.3
1926-27	79.6
1927-28	83.3
1928-29	90.9

In 1924-1925 the ratio increased considerably, but this was due to the crop failure of 1924.

A still greater discrepancy of prices is shown in the ratios of prices which peasants received for agricultural products to prices which they paid for industrial products. The so-called "peasant indexes," officially published by the Institute of Business Conditions, Commissariat of Finance, indicate that during the fall of 1926 these ratios were, for different agricultural regions, between 60 and 70, while the ratio of wholesale prices was at the level of 80 to 85—that is, the farmer received for his products in 1926—when the ratios had improved somewhat—not more than two-thirds and very often much less than what he received in 1913.[5] It should be stated that the ratio of agricultural to

[5] The same study shows the ratios of prices paid for agricultural products by the governmental purchasing organization to the index of retail prices. Such a ratio is published

industrial prices in Russia before the war was also unfavorable for agriculture, on account of the great protection given to industry during that time. After the war an increase in the ratio of agricultural to industrial prices was greeted with approval in other countries and the policies of the governments were directed to that end. In Soviet Russia, on the contrary, when agricultural prices increased in 1924-25 (due to the crop failure) the government sought to lower them as soon as possible with the result that in 1925-26 and 1926-27 agricultural prices declined considerably.

An official study of the cost of production of small grains in Soviet Russia demonstrated that the return for a labor day engaged in the production of grain sold at prices prevailing during 1926-27 and 1927-28 was considerably below the wages of hired labor in agriculture.[6]

Unprofitable agricultural prices affected negatively all agricultural production but particularly that of the larger farms producing goods for market. The low percentage of marketable goods to total agricultural production was perhaps the greatest evil in agricultural conditions of post-war Russia. This percentage was low even before the war, and since the war it has declined considerably. Gosplan calculated that the percentage of all agricultural products sold on city markets to the total agricultural production was

22.2% in 1913
16.3% in 1924-25
16.5% in 1925-26
16.9% in 1926-27

Some specialists in agricultural statistics state that the estimated percentage of marketable goods for 1913 is perhaps too low and for the post-war years somewhat too high.[7] But accepting them as true, they show a considerable decline in the percentage of marketable products in agriculture. This is due to the subdivision of large estates and to the equalization of peasant farms. To a certain degree this decline is also the result of the price policy of the Soviet government.

Changes in the prices of one group of agricultural products as

by the State Planning Committee (Gosplan), showing that in 1925-26 a peasant received only 66.2 per cent of pre-war prices, and in 1926-27—63.7 per cent. See "Kontrolnye Tsifry for 1929-30," by Gosplan, Moscow, 1930, p. 580.

[6] See article, "Problems of Price Formation in Agriculture," by Sh. J. Turetskii, Planovoe Khoziaistvo, 1929, No. 6, p. 94.

[7] Economic Bulletin of the Conjuncture Institute, 1927, Moscow, No. 11-12, p. 52.

compared to another resulted in increase or decrease of production the next year. That the Russian peasant is very sensitive to this fluctuation in the price of different products, and regulates his crops accordingly may be illustrated by several examples. For instance, during 1925 and 1926 the prices of some intensive crops such as sunflowers and sugar beets, were fixed relatively lower than those for other agricultural crops, particularly grain. As a result, in 1926 the production of intensive and technical crops declined relatively to the grain production level. However, from 1927 on, grain prices dropped to the lowest of all agricultural products. This situation resulted in an increase of crop acreage of technical and intensive crops, while the grain crop acreage did not increase and even declined. Since 1927 Russia has had her greatest difficulties with the grain supply.[8]

In order to establish complete control of the agricultural market and of agricultural prices, the Soviet government during recent years (especially since 1925) has developed with increasing vigor a system of monopolization for the purchasing of agricultural products. For this purpose several administrative measures were passed in order to eliminate private competition completely from the agricultural market. In 1925 an order was issued by which grain and other agricultural products from private dealers were given the lowest ranking in the category of goods transported by rail. This meant practically the complete elimination of "private" agricultural products on the railroads. Somewhat later the railway rates for such private consignments were increased 50 to 100 per cent in comparison with what was charged for similar consignments of the state. Another condition unfavorable to private shipments was found in the fact that generally no shelter was available for "private" grain in railway stations. At the same time that the rates were increased, the government ordered complete nationalization of private flour mills. And a further step in this direction was taken when bank credit was forbidden to private persons engaged in the grain trade.

In this way private competition was practically eliminated in the purchasing of grain—although it was not forbidden by the law. Before the above-mentioned measures were put into effect "private" grain amounted to 20 to 22 per cent of all the grain transported by rail, while at the end of 1926 the transpor-

[8] Economic Bulletin of the Conjuncture Institute N C Finance, Moscow, 1927, No. 11-12, pp. 50-51.

tation of "private" grain amounted to only 1.5 to 2 per cent of all the grain transported by rail.[9]

The monopolization of the grain market was followed by the monopolization of other agricultural products. The government is now trying to monopolize the market for vegetables and for animal products.

Along with the monopolization of markets there was also developing the control of prices. The grain market was completely monopolized first, and then grain prices were lowered drastically in 1926. The index of grain prices from 161.1 in 1925-26 (1911-14 equals 100) was down to 124.6 in 1926-27 and was kept at the low level of 134.6 during 1927-28. The prices which governmental purchasing organizations paid were still lower.

The market of animal products was at that time (1927-28) less monopolized by the government and the index of prices of animal products continued to increase after 1925-26, although it was on a higher level in 1925-26 (1925-26—158.8, 1926-27—172.2, 1927-28—174.6). Consequently peasants tried to increase their production of those products for which the market was less monopolized by the state and at the same time they lowered the production of monopolized products. As a result the crop area of grains practically did not increase between 1926 and 1930. The Soviet government encountered the greatest difficulties in procuring grain during the winter of 1927-28. After this time the Soviet government was obliged to resort to such methods of procuring grain as were practiced during the period of militant communism in 1918-21. Grains were not purchased at fixed prices but were requisitioned and if it was discovered that stocks were being concealed by peasants, they were confiscated and heavy fines (five times the value of the concealed grain) were levied upon the offenders. An implacable struggle against the well-to-do farmer was proclaimed, the fifteenth congress of the communist party which was held during the winter of 1927-28 has formulated a new agricultural policy directed against the well-to-do peasantry, the so-called "kulak."

The fourteenth congress of the communist party, in 1925, had continued to grant some concessions to the well-to-do peasant (the above mentioned facilities for the rent of land and for the use of hired labor). The fifteenth congress on the other hand proclaimed an agricultural policy which was directed definitely against the well-to-do peasantry: there were introduced stricter

[9] Haensel, P., The Economic Policy of Soviet Russia, London, 1930, pp. 68-69.

limitations for rent of land; leases longer than for six years were forbidden; "kulaks" were limited as to the use of hired labor; the inclosure of lands for individual farms was restricted or completely forbidden; the progression of agricultural taxes was made still greater.

However, the leaders of the communist party were fully aware that their agricultural policy could not be put into effect simply by limiting the activities of the well-to-do peasantry.

This practice alone would mean a decrease in the quantity of marketable agricultural goods, which up to this time had been produced mostly by the well-to-do peasantry; stagnation of agricultural production; and its degeneration to the production for home use only.[10] It was necessary therefore to replace the production of the "kulaks" with the production of some organization which could be controlled and directed by the Soviet government. For this reason the fifteenth congress of the communist party passed a resolution favoring the stimulation of cooperation among agricultural producers, not only for marketing but especially for production. The same measures which limited the activities of the wealthier peasants favored at the same time the development of collective farming: the purchasing of agricultural machinery by well-to-do peasants was to be limited and this machinery was to be sold to the collectives; the granting of credit was to be refused to the well-to-do peasants, but it was to be extended more liberally to the collective farmers; the inclosure of lands by the individual well-to-do peasants was to be forbidden and at the same time the collective farmers were to be encouraged in the inclosure of their land, even though it might upset the production of individual farmers.

Furthermore, very soon after the fifteenth congress, the central committee of the communist party adopted a resolution (June, 1928) for the development of a very ambitious program of state grain farming. It was resolved to organize a grain trust, the organization to include many very large state farms which, during the following five-year period were to be developed to such a degree that they would yield yearly from 1,600,000 to 1,700,000 tons of marketable grain, mostly wheat.

Thus it appears that in 1927-28 the Soviet government returned to its old project of the development of large-scale farming

[10] See "The Problem of Socialistic Reorganization of Agriculture," edited under the direction of Mr. J. A. Jakovleff, Moscow, 1928, preface, pp. XXVII-XXVIII. Mr. Jakovleff actually is the Commissary of Agriculture of the U.S.S.R.

along two lines; collective farms and state farms. We have seen that during 1919-21 this project had failed and the Soviet government had been obliged to renounce it. However, the Soviet government considered itself now better prepared to start once more. Then, too, the political reasons for their policy were perhaps more urgent than they had been at the time of the first experiment. The difficulties encountered in supplying the city population with grain, to say nothing about exports which had been discontinued early in 1927-28, demonstrated clearly to the Soviet government the danger of the situation. These difficulties had been caused mainly by the resistance of the well-to-do peasant to selling surpluses of grain, if any, at the low prices fixed by the government. These political considerations, more than any other reasons, induced the Soviet government to make itself independent of the well-to-do peasantry. The possibility of the development of agricultural production, based upon the initiative of the well-to-do peasantry was recognized as an alternative, but it was rejected for political reasons and because this way was considered capitalistic and incompatible with communist principles.[11]

The advocacy of such a "capitalistic" policy was laid by the ruling group at the door of the "right opposition" in the party. The ruling group itself accepted the policy of eliminating the individual well-to-do farmers and replacing them by large state and collective farms although even in 1928 the efficiency of the existing state farms was questioned by communist experts on agricultural problems such as the actual Commissary of Agriculture, and was considered to be lower than the efficiency of the large estates organized by landlords in pre-war times.[12]

The experience of 1919-21 had shown that it was impossible to take lands for state farms from the peasants in the greater part of European Russia. For this reason, from the beginning, the organization of large-scale grain production on huge state farms was planned for unoccupied lands in sparsely populated regions. In European Russia such unoccupied lands were to be found only in the regions east of the Volga and in the south-eastern corner, north of the Caucasus Mountains. These regions suffered the most from the famine of 1921 and the peasantry up to 1927-28 could not occupy all the land here. As early as September, 1928, about 5,000,000 acres were set aside for the state grain

[11] Op Cit., pp. XXVII-XXVIII.
[12] Op. Cit., pp. XXVIII, 311-312.

farms in this region. The other half of the planned 10,000,000 acres to be put into state farms for the territory of western Siberia and in the steppe region of central Asia. All these unoccupied lands may be characterized as semi-dry: the yearly rainfall in all these regions is from ten to fourteen inches. Also there are great fluctuations in precipitation from year to year. The settlement of the peasant population on such lands is a risky enterprise because failures of crops over several consecutive years are not infrequent and the support of a dense population on such lands during the periods of drought is a difficult problem. This is one of the reasons why from the beginning the state farms in these regions were planned to be wholly mechanized with a minimum of human labor and of livestock. All work was to be done by tractors and modern machinery, such as combines. The second reason for such an organization was that the Soviet government needed to obtain the largest possible surplus of grain from its farms. In order to utilize machinery and tractors most efficiently the state grain farms were planned to be of enormous size. By 1929 the average size of the 121 farms of the Grain Trust was given by official statistics at about 140,000 acres per farm. Many of them are much larger.

The first plan for the state grain farms, accepted in June, 1928, contemplated an aggregate area of 10,000,000 acres, with a total production of marketable grain of about 1,600,000 to 1,700,000 tons. But early in 1929 this project was more than doubled, for it was resolved during the five-year period to extend the area of state grain farms from 25,000,000 to 30,000,000 acres, of which 17,000,000 to 18,000,000 acres were to be in regions east of Ural, 8,000,000 to 9,000,000 acres in the basin of middle and lower Volga and in the North-Caucasian regions, and 4,000,000 to 5,000,000 acres in other regions of European Russia. In 1929-30, according to official data, 121 such farms were organized with a total area of 17,000,000 acres, 2,500,000 of which were under crops in the summer of 1930.

The execution of this project required from the State the investment of an enormous amount of capital. It was estimated that the organization and equipment of such farms, with a full supply of tractors and modern tilling and harvesting machinery (mostly combines), would require about $15 per acre. Many Soviet authorities considered this estimate too low. Experience with estimates on other constructive works in Soviet Russia had shown that generally actual costs of construction were much

higher than preliminary estimates. But even accepting this estimate, the total investment in state grain farms would be not far from a half billion dollars.

It is difficult to estimate at this time how successful this ambitious project will be. Only two years have passed and it is, of course, only for this short period that we know the results. In the year 1930 the weather was favorable to dry farming and accordingly the yield must have been good, especially on prairie lands ploughed for the first time. As a matter of fact, most of the state farms were made up of virgin land. There are no reliable data as to costs of production on the state grain farms. It may be supposed that extensive small-grain farming on large farms supplied with modern machinery may be profitable if the management is efficient, but experience with state farms existing about 1919-20, in several regions of European Russia, indicated that generally their management was rather inefficient. Furthermore, in 1928 after several years of experience and reorganization, production on state farms was often less efficient than on small peasant farms. This situation was clearly recognized in 1928 by the director of the agricultural policy of Soviet Russia.[13]

This may be said quite definitely, even now, concerning the project of the Grain Trust: the investment by the state of enormous capital in such a hazardous enterprise may be considered very questionable at this time when Soviet Russia is suffering from a deficiency of capital for many other very important projects. It would be much more reasonable to encourage investments in agriculture by the peasants. State funds should be reserved for such projects as the development of transportation system, especially in new and sparsely populated regions; reclamation of lands, etc. But, as was said above, the policy of combating the well-to-do peasantry has discouraged them from savings and investments. As we shall try to show later, even the organization of collective farms is going on largely on account of investments made for the most part by the state. Furthermore, the recent agricultural policy of the Soviet government has resulted in a very serious disorganization of the livestock industry and now the Soviet government is obliged to start the new, and perhaps still more ambitious project, of organizing the animal industry on large state farms, united in trusts, such as "Skotovod" (cattle breeding trust), "Ovtsevod" (sheep breeding trust), "Svinovod" (hog-breeding trust), dairy trust,

[13] See "The Problem of Socialistic Reconstruction of Agriculture," mentioned above, p. 322.

etc. These new state enterprises may well require still larger investments. It seems that these new and unexpected investments in large agricultural enterprises are in a large measure responsible for the unbalanced financial situation in Soviet Russia last year and for the monetary inflation which exists unquestionably. And the depreciation of the monetary unit may put many new difficulties in the way of the agricultural developments of Soviet Russia.

The organization of large-scale collective farms is a second line of socialistic reorganization of the Russian agricultural system. It was stated above that during the period 1921-27 collective farms made little progress, and on the adoption of the new economic policy (NEP) these farms passed through a serious crisis. Unprepared for doing business on a monetary basis comparable with that of the ordinary cooperative farms with which they must compete, the communes and artels (different forms of collective farms) were broken up. According to statistics of the Central Statistical Office, out of 15,800 collective farms reported at the end of 1921, there remained by April, 1924, only 10,600.[14] The decrease was greatest in those organizations which were most socialistic—the communes. The simpler voluntary associations for the tillage of the soil were reduced to a lesser degree. In 1924 the decline in the number of collective farms ceased, and there was even a slight revival—the total number of producing associations increasing in one year by nearly 25 per cent. In 1925 there were 13,100 small collective farms. After that time, however, they increased at a slower rate and on June 1, 1927, official statistics give the number of all forms of collective farms at 14,800, which is less than in 1921. The increase since 1925 was due entirely to the fact that a simpler type of association was set up with the result that since 1928 their number has practically trebled, while communes and artels have declined in number. By the middle of 1927 all forms of collective farms consisted of less than 1 per cent (0.8%) of the total number of peasant households, and these sowed only 0.7 per cent of the total crop area. Thus their percentage of output in the total agricultural production of Soviet Russia was of minor importance.

During the period 1924-27 the government had granted some privileges to the agricultural collectives, such as tax reduction, special consideration in the supply of agricultural equipment,

[14] Bulletin of the Central Statistical Office of the U.S.S.R. No. 102, July, 1925, pp. 73-75, and No. 116, Feb., 1926, pp. 117-118.

preferential treatment in land settlement, and so on, but these privileges were no longer of the exclusive character which existed during the period when producers' associations were so much in vogue—1919-20. During this period official opinion itself did not estimate too highly the importance of collective farming. It recognized the advantages of communes and artels from the point of view of socialist theory but did not regard them as a "trunk road" toward socialism, but merely as a "branch road."

The situation changed completely after 1928. The Soviet government, after proclaiming its policy of eliminating the well-to-do peasants, decided to replace their marketable surpluses of agricultural products by those of collective farms, and directed all its resources toward aiding these collectives, giving them innumerable privileges, and at the same time, depriving the wealthier individual farmers of all possibilities for development. The monopoly which it had of agricultural markets and of the system of distribution for industrial products gave enough power to the government to enable it to follow such a policy. The collective farms received considerable financial support in the form of cash credits and of special credits for the purchase of machinery. At the same time they obtained preferential treatment in the matter of purchasing machinery, while individual well-to-do farmers were limited in the machinery which they could buy. There were some kinds of machinery, such as tractors and other complex agricultural machinery, which it was not permissible to sell at all to the "kulak." The collective farms had also special privileges with reference to inclosing their land from community lands. This they could do at any time, without the approval of the community, even though this inclosure brought about a complete change in a recently established land organization of the community. (Decree, April 30, 1928.) By a decision of the Soviet government, the bulk of the expenses involved in consolidating the land into collective farms was assumed by the state, while individual farms had to pay from their own resources at least part of such expenses. The tax payments of collective farms were considerably reduced. Often these farms were entirely exempted from the payment of certain taxes. The granting of loans to collective farms was so liberal that half or more of their means of production were acquired through state credit (survey of collective farms in 1928). Sometimes the credit obtained from the state exceeded the total value of the means of production of the collectives; that is, a part of the credit received

by the collectives was used in the individual households of members.[15]

It must be emphasized that the progress of collective farming in Soviet Russia was not a spontaneous movement of the peasantry. It was based on the privileges granted by the government to collectives and was limited in its development by the amount of financial assistance which the government was ready to grant. This fact is quite openly recognized by the Council for Collective Farms of the U.S.S.R.[16] Since in 1927-28 the Soviet government had more financial resources and could give more help to protected groups of peasants in the form of agricultural machinery than it had been able to give during 1919-20, the development of collective farming after 1927 was much more rapid and extensive. Using official statistics of the progress of collectivization in Soviet Russia the following table may be given:

DEVELOPMENT OF COLLECTIVE FARMS IN SOVIET RUSSIA

Date	Number of Collective Farms (In thousands)	Number of Households Members of Collective Farms (In thousands)	Number of Households Members of Collective Farms (In per cent of total number of peasant households)
June 1, 1927	14.8	195	0.8
June 1, 1928	33.3	417	1.7
June 1, 1929	57.0	1.003	3.9
October 1, 1929	67.4	1.919	7.4

Over a period of less than two years and a half the number of peasant families involved in collective farming increased about ten times and by the fall of 1929 collective farms became a considerable factor in the agricultural activity of Soviet Russia.

It may be of interest to state that the growth of the idea of collective farming was not so rapid on all territory of Soviet Russia as in the regions of surplus production of small grain, such as the steppe area. Several reasons may be mentioned why collective farming developed more extensively and rapidly in the surplus grain producing regions. First, as we have seen, it was the policy of the government to increase the production of marketable grain by collectives because it was in the production of marketable grain that the government had met most of its difficulties. But there were other factors involved: crop production, and particularly small grain production, is the field where col-

[15] See Gaister, A., "Dostizheniia i Trudnosti Kolkhoznogo Stroitelstva (The Results and the Difficulties of the Organization of Collective Farms), Moscow, 1929, pp. 33-34.

[16] "Problems and Perspectives of the Organization of Collective Farms." The project of five-year plan for 1928-1932-33, Moscow, 1929, pp. 41-102.

lective farming by a group of former individual small farmers, may have some technical advantages, especially if the collective farm is supplied with modern agricultural machinery, which the small individual farmers either lack completely, or cannot use efficiently on their small holdings. Exactly these conditions were found to prevail in the steppe regions of Russia where there was a large percentage of peasant households without working livestock and agricultural implements. This semi-proletarian peasantry had increased its land holdings during the revolution, it is true, but had not enough means of production at its command to work its land efficiently. The character of this semi-proletarian peasantry was also a factor. It must be borne in mind that in Soviet Russia the development of collective farming has not been a peaceful process. Its evolution has been a kind of class struggle. The government has tried to enlist the support of the proletarian and semi-proletarian groups in its struggle against the "capitalistic" elements in the country. In the steppe regions, with a sparser population composed largely of the well-to-do and semi-proletarian groups, the peasant class was, in general, less homogeneous than it was in the more densely populated regions of central Russia, and it was therefore easier to organize an internal class struggle by giving privileges to some and withholding them from others.

Furthermore, the method of farming in the steppe regions lends itself more readily to collectivization. It may be characterized as extensive since undiversified grain farming is predominant. The livestock industry is of secondary importance. All experiments with collective farming in Soviet Russia have shown that animal husbandry is the most difficult industry to collectivize and is least successful when accomplished. Generally speaking, collective farms are not stocked with livestock to the same extent as peasant farms and this is especially true with regard to cattle and other productive livestock. Individual peasant householders, joining collective farms, prefer to keep their cows, pigs, and sheep on their own individual farms. For this reason, the regions devoted largely to animal husbandry, as opposed to grain production, are less adaptable to collectivization. Therefore, government help in supplying machinery to collective farms in these regions is of minor importance since machinery is of little use in this industry. The advantages of machinery are not enough to counterbalance the disadvantage involved in the collectivization of the livestock industry.

Quite recently, following the failure of the collectivization campaign in the livestock industry during the past winter, the Soviet government granted further privileges to the collective farms, favoring the collectivization of livestock. For example, it exempted from all taxation for two years the livestock of the members of collectives (see Resolution of the Central Committee of the communist party of April 2, 1930). If we take into consideration that the taxation of livestock of the individual farmers is very heavy and that it increases very rapidly with the increase in the number of head of livestock, the importance of the last privilege will be more evident.

We have tried to give some reasons for the rapid development of collective farming during the last two or three years. We shall now mention some of the limitations of this movement. One of the limitations has just been mentioned: collective farming develops more or less successfully only on crop farms. On the other hand, in animal husbandry collective farming up to the present has not been successful. For this reason the possibility of organizing collective diversified farming is questionable. It is true that there is a possibility of organizing collective crop farms, reserving animal husbandry to the individual households of the members of the collective farm. But it is against such a form of organization that the Soviet government contends. It fears that this practice would develop individualistic and capitalistic tendencies in some of the members of the group. Another difficulty is the fact that the development of specialized collective grain farms does not correspond well to the type of agriculture prevalent in many regions of Soviet Russia. Furthermore, the distribution of labor throughout a year is very uneven on the specialized collective grain farms, no better, in fact, than on the individual small farm of the same kind.

As a second limitation that may be mentioned collective farms up to 1929 were too small to use successfully and efficiently such modern machinery as tractors, combines, etc. They included on the average ten to fifteen families, with seventy-five to one hundred and twenty-five acres of crops, which is not larger than the average individual farm in America. All attempts of the Soviet government up to 1930 to increase the size of the collective farms were rather unsuccessful. In 1930 the size of the collective farms sharply increased, but about the methods of collectivization during the winter 1929-30 we shall speak later.

Collective farms are very unstable in their organization and

their membership. The fluid character of the membership of collectives was emphasized by all official studies of collective farms. The turnover of membership in the collective farms is so large that they have been called ironically "house with thoroughfare." During each year of the period 1927-29, 15 to 25 per cent of the total membership left the collectives and was replaced by new members. At the same time yearly, about 20 to 30 per cent of the total number of collective farms were dissolved and new ones organized instead. Such an instability of membership and of the collective farms themselves without doubt, has interfered very much with a rational organization of farming. Official publications have frequently emphasized the fact that collective farming introduces a more rational crop rotation of from six to eight years' duration instead of the traditional three years' rotation more common on the individual peasant farms. However, this statement must be challenged as at least too premature, because after two or three years of experience it is difficult to say that a six to eight years' rotation has been really successfully introduced.

Too much hurry and precipitation is perhaps the greatest disadvantage in the campaign for collective farming in Soviet Russia. It was mentioned above that during 1927-28 the number of peasant households involved in collective farming increased about tenfold. But this tempo (this word is actually very much in vogue in Soviet Russia) is nothing compared to the development of collective farming in Soviet Russia during the winter of 1929-30. What happened during this winter is difficult to understand. From 1927 to 1929 the principal method of stimulating the development of collective farming was the granting of privileges to the collective farms and to their members as opposed to the individual farmers. During the winter of 1929-30 the Soviet government, anxious to replace the production of the well-to-do peasantry by that of the collectives, and to "exterminate" the kulaks as a class, resorted to administrative coercion and pressure on the peasantry to compel them to join collective farms. The fact of coercion and pressure was officially recognized by Stalin himself, in his letter of March 2, 1930. In this letter, and in further publications of the communist press, numerous examples were given of stringent administration measures used by local administrative officers to force peasantry into collectives. Stalin tried to disparage these measures and to make the local administration responsible for them. However, it is

difficult to believe that in Soviet Russia with its complete centralization it was possible for the local administration over a period of months to continue a policy which was contrary to the plans of the central government. It seems evident that it was the policy of the central government and that it was only when it produced very dangerous unrest in the country that it was decided to retract a little and to put the responsibility on the local administration.

The pressure on the middle peasantry to join collectives was accompanied by a bitter struggle against the wealthier peasantry, the kulaks, by confiscation of all their property, and by expelling them from their residences.

To accept the wealthier peasants as members in collective farms was forbidden. They could not be accepted as simple workers on collective farms even after wholesale confiscation of their property. The fact that a cruel class struggle was waged and that the property of the kulaks was confiscated has been officially admitted, but the policy of the communist press has been not to go much into the details. However, it is quite clear that during the winter of 1929-30 a real civil war raged through Russian villages. This social revolution which swept over the country during that winter may turn out to be the most important since 1917.

The speech of the actual Commissary of Agriculture of the U.S.S.R. at the sixteenth congress of the communist party[17] gave some interesting statistics as to the amount of confiscation of property from "kulaks." He stated that by the summer of 1930, 15 per cent of the capital of all collective farms consisted of property confiscated from "kulaks." This calculation related only to buildings, machinery, equipment and livestock. Land was not included. When we take into consideration the fact that by the summer of 1930 from 40 to 50 per cent of peasant households in some of the principal grain regions had become a part of the collective farm system and that the "kulaks" represent 3 to 5 per cent of the total number of peasant households, it may be understood what great losses were suffered by them. The "kulaks" lost also all, or the greater part of their land.

In the same speech Mr. Jakovleff stated that two-fifths of the capital of the collective farms was covered by state credit, so that about three-fifths of the total capital of collective farms was given by the state or represented confiscations of property of

[17] See daily paper of the communist party, "Pravda," No. 190, July 12, 1930.

other peasants, who themselves were not admitted in the collective farm organization. Such were the "incentives" which brought the mass of semi-proletarian peasants to the collective movement.

The results of this double policy of coercion and of bribery were at first sight striking. 59.3 per cent of the total number of peasant households in Soviet Russia became members of the collective system on March 1, 1930.[18] In some of the most important agricultural regions with surplus grain production, the percentage of collectivization was announced still higher—70, 80, and 90 per cent. Thus, an agricultural organization which had existed for hundreds of years was radically changed in a few months, 25,000,000 peasant households being affected. However, this did not continue long. On March 2, 1930, Stalin published his famous letter which proclaimed that peasants were not to be forced into the collective system but could join them voluntarily, and there immediately began an outpour of forced peasants from collectives. Two months later, by May 1, 1930, official statistics[19] showed that the percentage of collectivized peasant households was only 24.1 per cent, a decrease of more than one-half since March 1. On the other hand, there are some communist writers who doubt that many peasant households were actually members of the collective system on March 1, 1930, expressing their opinion that many of the collective farms were listed only on paper.[20] Nevertheless, the process of the formation of "collectives" as well as their dissolution (even if only "paper" collectives) was not "painless." The second question raised was how many of the collectives reported on May 1, 1930, were real collectives. Statistics given out by the head of the Council of National Economy of Soviet Russia, Mr. Kuybyshev, show the percentage of collectivized peasant households on October 1, 1930, to be 21.5 per cent,[21] that is, 2.5 per cent lower than on May 1, 1930. Is this an actual decline, or simply a matter of having more exact statistics on this question?

However, even if we accept the last estimate, this one-fifth representing collectivized peasant households can be a very important factor in the agricultural situation in Soviet Russia, especially if we take into consideration the fact that in the major

[18] See article, "The Problems of Collectivization of the Country," by M. Kraev, Planovoe Khoziaistvo, 1930, No. 5.
[19] See "Agricultural Statistics of the U.S.S.R.," published by the Lenin Academy of Agricultural Sciences (in English), Moscow, 1930, p. 42.
[20] See above mentioned article of M. Kraev.
[21] See New York Times, December 1, 1930.

grain surplus regions this percentage is from thirty to fifty per cent. The question is only how vital are all these collectives. The fact that the percentage of collectivized peasant households may fluctuate during one year (from 7.4 per cent on October 1, 1929, to 59.3 per cent on March 1, 1930, and 21.5 per cent on October 1, 1930) indicates that the situation cannot be said to be stable yet. Methods of promotion of the collective farm system and the difficulties of organization are important factors governing the situation. The authoritative Soviet organization which controls collective farming in all the U.S.S.R. —the Council for Collective Farms—in its five-year plan for collectivization (1928-29 to 1932-33) recognizes these difficulties. For instance it states[22] that it is impossible to create successful collective farms without furnishing them with tractors and modern agricultural machinery, yet only a small percentage (not more than 15 per cent) of recently organized collective farms have tractors and the other farms continue to work with peasant horses and peasant implements. The greater number of tractors are found on the state grain farms. The total number of tractors in Soviet Russia is not large, a liberal estimate placing them at 70,000 to 75,000 on October 1, 1930.

The same Council recognizes that the organization of large collective farms is a much more difficult and complex problem than the organization of large state farms. It was estimated that for the collectivization of 16 per cent of the peasants' households during the five-year period, it would be necessary to engage a staff of eleven to twelve thousand college trained agriculturists, and it would be necessary to reorganize all agricultural education of Soviet Russia for this purpose (p. 81). However, one year later, in 1929-30, the Soviet government found it possible to collectivize a much greater percentage of peasant farms and accomplished this in the one year, though without a sufficient number of trained agriculturists, and before the reorganization of the agricultural colleges was completed.

The result was that the collective farms were insufficiently staffed with trained agriculturists and were without competent assistants to organize even the simpler forms of accounting.[23] At the same time, the size of these collective farms continued to increase so that, without question, they required the guidance of

[22] Op. Cit., p. 16. "Problems and Perspectives of the Organization of Collective Farms," Moscow, 1929.

[23] See article, "In the Regions of Thorough Collectivization," by M. Solomonov, Planovoe Khoziaistvo, 1930, No. 2, Moscow, p. 239.

experts, especially in organizing the work which, in the nature of the case, was radically different from the traditional form of peasant farming. On May 1, 1930, the collective farms, on the average, consisted of from sixty to seventy households, with a crop area of about 1,200 to 1,300 acres. In some of the regions much larger farms were found. The greatest difficulty encountered in the organization of these large collective farms resulted from the low level of intelligence of the Russian peasantry and the lack of trained specialists. The Soviet government mobilized coercively all college trained agriculturists and sent them to the collective "front" (making use of militaristic terminology). It is perhaps incorrect to speak of "forced" labor in connection with these trained specialists, but it is quite reasonable to designate this labor as "militarized."

What is especially dangerous for the stability of the new agricultural system in Soviet Russia—introduced in such a hurry—is the fact that it was put into effect with coercive methods, the system being forced on the peasantry, and being accompanied by a cruel campaign against the well-to-do peasantry.

As a result, in organizing agriculture into collective farms, the Soviet government disorganized all the social life of the countryside, and destroyed invaluable capital goods accumulated by the well-to-do peasantry during the preceding ten years. An illustration may be found in the great decrease in the number of livestock in the year 1929-30, a decrease so formidable that it would seem incredible if it were not confirmed by many authoritative sources.[24] During one year the number of horses decreased by 10 per cent, or 2,500,000 head, the number of cattle by one-fifth, or 15,000,000 head, the number of sheep by one-third, or 43,000,000 head, the number of swine by two-fifths or 8,000,000 head. Such a decrease of livestock in one year had never been known in Russian history. Even after the famine of 1921 the losses of livestock were smaller, although millions of human beings were lost. This decline in the number of livestock demonstrates clearly what a catastrophe occurred to Russian agriculture during the last winter. Trying to solve one problem, to increase grain production, the Soviet government destroyed a still more important, or at any rate, a branch of agriculture more difficult to recover. The policy of forced collectivization and the struggle against the well-to-do peasantry were responsible for

[24] See speeches of Stalin and Jakovleff at the sixteenth congress of the communist party, Pravda, No. 177, June 29, 1930, and No. 190, July 12, 1930; also "Agricultural Statistics of the U.S.S.R.," mentioned above.

this catastrophe. The well-to-do peasant preferred to slaughter his livestock rather than to have it confiscated. The middle peasant, forced to join a collective farm, preferred before joining to sell or to slaughter his livestock, for if he brought it to the collective farm it was accepted at a very low valuation.[25] Many peasants joining collective farms expected that the government would give them enough tractors and equipment to enable them to work their land. Official propaganda in some regions designed to promote collectives, was perhaps responsible for such a belief.[26]

Now, in order to repair the damage to the livestock industry which its policy has caused, the Soviet government has started a new project of state organization of the livestock industry on huge state farms managed by the Trusts which have already been mentioned. These projects are still in their infancy and it is impossible to say anything definitive about them, except that the application of bureaucratic forms of organization to this branch of agriculture may well be considered as still more questionable than their application to the organization of grain production.

Discussion by J. G. Ohsol

New York

I should like to ask Professor Timoshenko whether it would not be more correct to explain the recent farm collectivization policy of the Soviet government by the impossibility of coordinating large-scale planned state industry with twenty-four million small peasant farms with very fluctuating returns?

Furthermore, the very fact that within two years over five million small farms have been merged into collectives would seem to indicate that this process of collectivization has been supported by the bulk of the peasantry, else it would have been impossible to keep them together by any compulsory means. Likewise this year's increased returns of the grain harvest by 18 to 20 per cent certainly show that the large state grain and collective farms have met with appreciable success.

This fall, after the peasants became convinced that the collective farms really insure better yields and better returns for their labor they are applying in large numbers for the admission to collective farms.

Speaking of livestock farming, one should remember that model beef cattle and dairy farms in this country are found among the largest, not among the smallest farms. Would it not, therefore, be fair to assume that the Soviet Union might also succeed with the organization of large-scale livestock farms? Should we not rather await some positive proof before pronouncing any definite judgment?

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[25] See article, "In the Regions of Thorough Collectivization," by M. Solomonov, mentioned above, p. 235.

[26] Ibid, pp. 235-236.

THE EFFECT OF RAINFALL AND TEMPERATURE ON CORN YIELDS IN KANSAS

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The purpose of this article is to point out some of the more important relationships of rainfall and temperature to corn yield in the state as a whole and in selected type-of-farming areas of Kansas. The relationships have been arrived at by the application of multiple *(13)* and multiple curvilinear correlation methods *(3) (5)*. The period selected was from 1892 to 1928 inclusive, except for area 11, for which 1892 was not included in the correlations on account of lack of a portion of the weather data.

Brief Survey of Work Done

Wallace *(14)* has pointed out that there is considerable variation in the effect of weather factors on corn yields in the eight corn belt states. For example, he maintains that conclusions which are justified for Ohio may not fit Iowa and that even for Iowa there are significant differences for different sections. He has worked out curvilinear relationships between corn yield and several weather factors in Polk County, Iowa. He further concludes that, "The problem of predicting corn yield from the weather is relatively simple in the southern half of the corn belt, notably in Kansas, Missouri, and southern Illinois where drought and heat in June, July, and August are the chief influences. The problem is to measure the degree of drought and heat with accuracy."

Using the period from 1891 to 1919 he obtained the following gross correlations between yield of corn in Kansas and the factors selected:

	Temperature	*Rainfall*
May	—.060	+.463
June	—.477	+.410
July	—.748	+.770
Aug.	—.555	+.540

Selecting June, July, and August rain, he obtained a multiple correlation of R = .862.

[1] The writer wishes to express his appreciation for suggestions and constructive criticism by Dr. W. E. Grimes, head of the Department of Agricultural Economics of Kansas State Agricultural College, and Dr. J. D. Black of Harvard University.

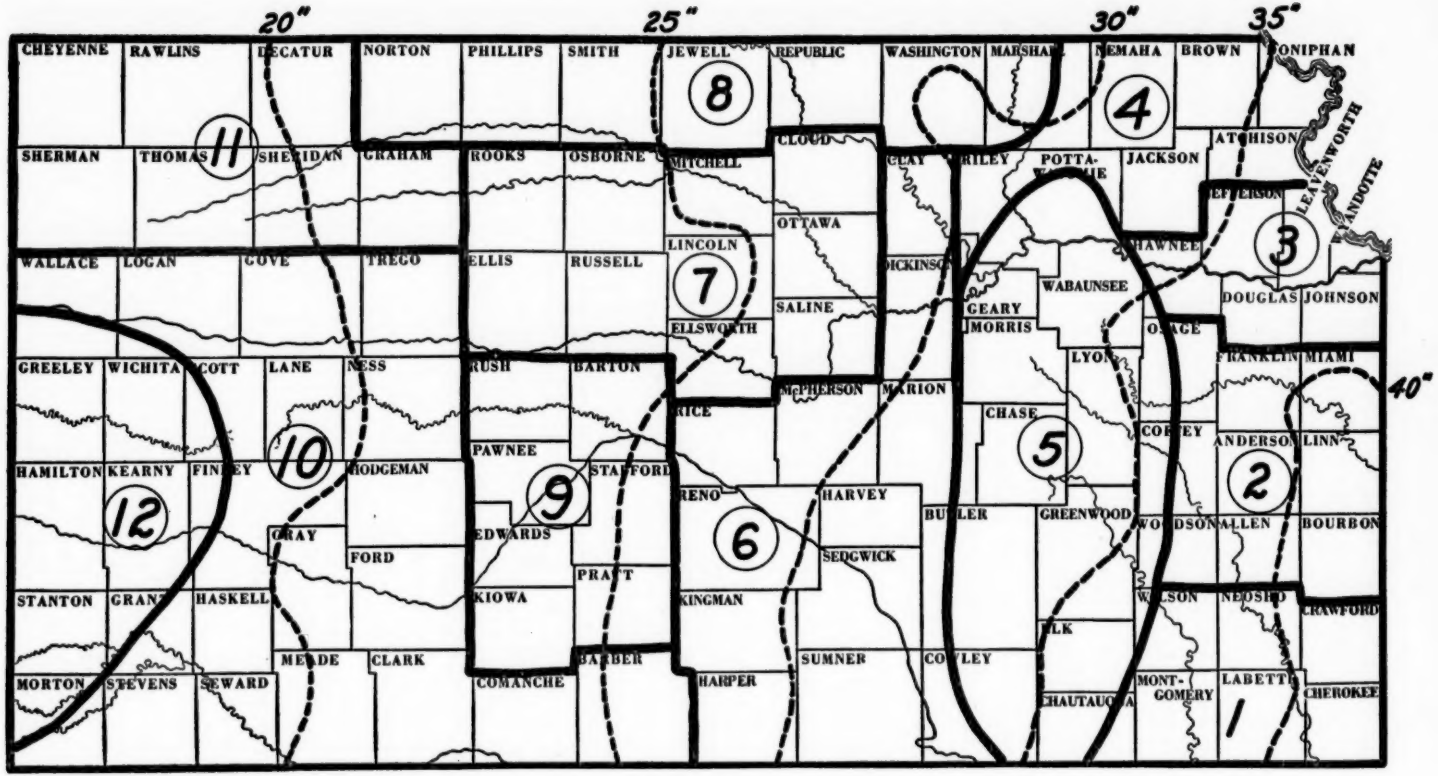

FIG. 1. Type of farming areas in Kansas. Lines showing the approximate normal rainfall are also shown. (6)

Mills *(8)* used corn yield in Kansas and temperatures for June, July, and August, in order to illustrate the methods of multiple and partial correlation. If the same yield and trend figures are used, coefficients for the rainfall in the same months may be worked out. A comparison of the results thus obtained is shown below:

Corn yield and:

Temperature in June, July and August	Rainfall in June, July and August
$R_{1.234} = .778$	$R_{1.234} = .8184$
$r_{12} = -.4814$	$r_{12} = .3772$
$r_{13} = -.6968$	$r_{13} = .6953$
$r_{14} = -.4937$	$r_{14} = .4536$
$r_{12.34} = -.2412$	$r_{12.34} = .2628$
$r_{13.24} = -.6265$	$r_{13.24} = .6926$
$r_{14.23} = -.3681$	$r_{14.23} = .5845$
$S_{1.234} = 21.68$	$S_{1.234} = 19.826$
	(In per cent of trend)

Considering the slight difference in years included and method of calculation, the gross correlations are not materially different from those quoted from Wallace. All coefficients except the one with temperature in June are smaller, those for rainfall showing the greatest differences. The multiple coefficient of yield with rainfall in June, July and August is also smaller. These figures indicate a closer relationship between corn yield and rainfall than between corn yield and temperature for the state as a whole. Considering the partial coefficients the indicated relationships between yield and temperature and between yield and rainfall are closer for July, followed by August and June, respectively.

The Corn Enterprise in Kansas

Approximately one-third of the crop area of Kansas is occupied by corn. It occupied the largest acreage of any crop until 1907 when its acreage was exceeded by that of wheat. This did not occur again until 1914. The wheat acreage has exceeded that of corn in all succeeding years except 1917 when the abandonment of wheat sown the previous fall was unusually high.

The type of farming areas in Kansas are shown in Figure 1. A description of these areas and the bases upon which they have been selected are given in "Types of Farming in Kansas" *(6)*. Areas 4, 9, and 11 have been chosen for special consideration in

this study. Figure 1 also shows the approximate quantity of rainfall which may normally be expected in the various areas.

Area 4 is one of the most important corn producing areas in the state. The normal annual rainfall ranges from about 30 inches in the west to more than 35 inches in the east.

In area 9 wheat is much more important than corn except on the better adapted soils. The normal annual rainfall ranges from about 20 inches in the western part to slightly more than 25 inches in the east.

In area 11 wheat is a more important crop than corn which is a close second. Some years corn acreage exceeds wheat, the heavier corn acreage usually following abandonment of wheat.

Variability of Corn Yield and Weather Factors

In Table 1 is given a comparison of the averages, standard deviations and coefficients of variability for the years 1892 to 1928 of corn yield, and rainfall and temperature in the state and

TABLE 1. A COMPARISON OF CORN YIELD AND VARIOUS WEATHER FACTORS IN THE STATE AND AREAS 4, 9, AND 11 BY MEANS OF AVERAGES, STANDARD DEVIATIONS, AND COEFFICIENTS OF VARIABILITY (1892 TO 1928).

	The State	Area		
		4	9	11
Corn Yield:				
Average	19.65	26.70	15.27	13.27
Standard deviation	7.14	7.95	7.73	8.03
Coefficient of variability	.3634	.2978	.5062	.6051
Rainfall in May:				
Average	3.74	4.55	3.29	2.69
Standard deviation	1.59	2.77	1.78	1.46
Variability	.4251	.6088	.5410	.5427
Rainfall in June:				
Average	4.09	4.66	3.94	3.29
Standard deviation	1.74	2.27	2.11	1.62
Variability	.4254	.4871	.5355	.4924
Rainfall in July:				
Average	3.46	4.16	3.06	3.20
Standard deviation	1.32	2.07	1.84	1.33
Variability	.3815	.4976	.6013	.4156
Rainfall in August:				
Average	3.17	3.98	2.91	2.66
Standard deviation	1.32	2.08	1.75	1.28
Variability	.4164	.5226	.6014	.4812
Temperature in June:				
Average	73.30	73.00	73.35	70.50
Standard deviation	2.94	2.68	3.37	3.18
Variability	.0401	.0367	.0459	.0451
Temperature in July:				
Average	78.24	77.68	78.41	76.11
Standard deviation	2.26	2.58	2.52	2.57
Variability	.0289	.0332	.0321	.0338
Temperature in August:				
Average	77.38	76.59	77.70	75.08
Standard deviation	2.80	3.12	3.14	2.89
Variability	.0632	.0407	.0404	.0385

in areas 4, 9, and 11. Over the entire period the average corn yield of Kansas was approximately 20 bushels; that of area 4, 27 bushels; of area 9, 15 bushels; and of area 11, 13 bushels. The yield of corn in area 4 is 18 per cent less variable, while that of area 9 is 39 per cent and that of area 11, 67 per cent more variable, than of the state as a whole.

Factors Used in Study

The factors used in the correlations may be briefly described as follows:

X_2, Rainfall in May
X_3, Rainfall in June
X_4, Rainfall in July
X_5, Rainfall in August
X_6, Temperature in June
X_7, Temperature in July
X_8, Temperature in August
X_1, Corn yield in per cent of trend

The total monthly rainfall and the monthly mean temperature for the state were used for the months considered. For the various areas two or more stations were selected which seemed to represent them best in so far as completeness of data over the period permitted.

The yield data were rounded by a five-year moving average before working out a straight line trend. The method used for the latter was that described by Persons *(11)*. The percentage deviations were taken from these straight line trends.

Figure 2 gives the trend of corn yield for the state as a whole and that for area 11. The trend in area 4 is downward, being similar to that of the state while that of area 9 is upward, or similar to that of area 11.[2] In areas 9 and 11 it seems probable that the upward tendency in trend was due to better methods in more recent years, such as wide row culture, better tillage practices in general, and better adapted varieties. The large deviations from the trend, especially in area 11 are well illustrated in the chart.

Table 2 shows the coefficients of linear multiple correlation be-

[2] The equations for the straight line trends were as follows:
THE STATE $Y = 19.4242 - .1296X$, WITH ORIGIN AT 1910.
AREA 4 $Y = 26.2970 - .0952X$, WITH ORIGIN AT 1910.
AREA 9 $Y = 15.2727 + .0530X$, WITH ORIGIN AT 1910.
AREA 11 $Y = 13.0424 + .1209X$, WITH ORIGIN AT 1910.

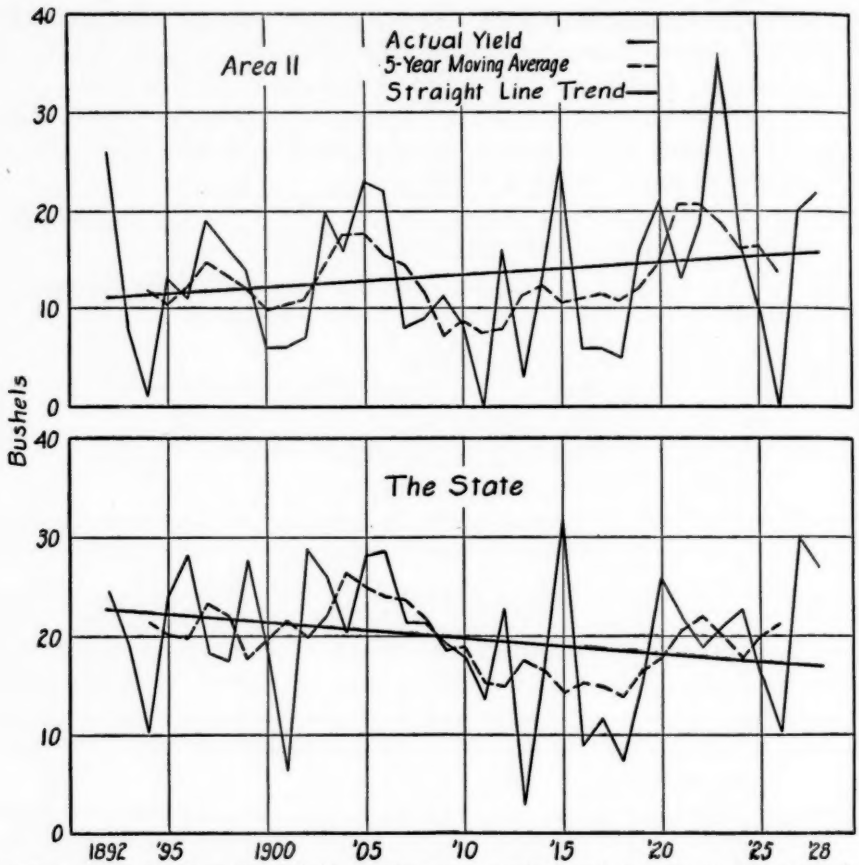

FIG. 2. The trend of Corn yield in Kansas as a whole and in area 11. The trend in area 4 is similar to that of the state and the trend in area 9 is similar to that in area 11.

tween corn yield and the seven weather factors. The highest coefficient is for area 9, followed in order by area 4, the state, and area 11. After correction for the number of constants in the regression equations, the coefficients of total determination are,

TABLE 2.—COEFFICIENTS OF MULTIPLE CORRELATION (R) BETWEEN YIELD OF CORN AND RAINFALL IN MAY, JUNE, JULY, AND AUGUST AND TEMPERATURE IN JUNE, JULY AND AUGUST.

Area	Uncorrected	Corrected (a)
State	.8548	.8161
4	.8570	.8190
9	.8684	.8337
11	.7604	.6876

(a) The correction formula used was:

$$\bar{R}^2_{1,234\cdots n} = 1-(1-\bar{R}^2_{1,234\cdots n})\left(\frac{N-1}{N-M}\right) \qquad (5)$$

for the state .666; for area 4, .671; for area 9, .695 and for area 11, .473. This indicates that approximately two-thirds of the variation in yields in the state and for all areas except 11 is accounted for by the factors included. In area 11 less than half of the variation in yield is accounted for by the factors studied.

Some idea of the importance of the various factors may be obtained by an examination of coefficients of determination in Table 3. The coefficient for each factor is given in the form of a per cent of the total determination (R^2), which is considered as the percentage of the variation in corn yield accounted for by the seven factors included.[3] These coefficients show the tendency toward the greater importance of rainfall in the eastern and temperature in the western part of the states.[4]

TABLE 3.—COEFFICIENTS OF DETERMINATION SHOWING THE RELATIVE IMPORTANCE IN PER CENT OF THE SEVEN FACTORS, RAINFALL IN MAY, JUNE, JULY, AND AUGUST AND TEMPERATURE IN JUNE, JULY AND AUGUST.

Factor:	State	Area		
		4	9	11
X_2	(−).52	.27	3.04	12.07
X_3	4.49	.88	3.42	5.41
X_4	24.63	30.22	21.94	1.42
X_5	17.52	15.86	12.11	1.63
X_6	8.57	3.60	10.59	7.24
X_7	15.65	4.39	20.58	23.72
X_8	2.73	18.23	3.56	6.34
Total	73.07	73.45	75.42	57.83

Curvilinear Relationships

It has been pointed out by Wallace *(14)* and others that the relationship between corn yield and weather factors is not always linear. Temperatures or rainfall, both below and above the optimum for a given time, in a specific area may result in a decreased yield. For this reason the method of multiple curvilinear correlation *(3) (5)* was applied. By this method the indexes of multiple correlation (P's) were materially increased over the coefficients of multiple correlation (R's). The indexes were those given on page 312.

The closeness of relationship between corn yield and weather factors is slightly shifted from that shown by the linear analysis.

[3] In this case the corrections have not been applied.

[4] The regression equations for the state and various areas are given as follows:

State:

$$X_1 = -.4180X_2 + 2.2297X_3 + 10.4665X_4 + 9.1172X_5 - 2.3052X_6 - 3.7885X_7 - .7361X_8 + 209.6710.$$

Area 4:

$$X_1 = -2.3604X_2 + .4231X_3 + 6.8293X_4 + 4.3354X_5 - 1.1224X_6 - .9399X_7 - 2.9968X_8 + 196.2199$$

Area 9:

$$X_1 = 2.9051X_2 + 2.9319X_3 + 10.0835X_4 + 6.7299X_5 - 3.0303X_6 - 5.8563X_7 - 1.1180X_8 + 296.3146$$

Area 11:

$$X_1 = 9.3746X_2 + 4.5423X_3 + 1.2751X_4 + 4.8952X_5 - 2.5282X_6 - 8.5542X_7 - 2.8002X_8 + 386.2942$$

If these equations are to be applied 50 degrees must be subtracted from the temperature in each month before multiplying by the constants given.

TABLE 4.—INDEXES OF MULTIPLE CORRELATION (P) BETWEEN YIELD OF CORN AND RAINFALL IN MAY, JUNE, JULY AND AUGUST AND TEMPERATURE IN JUNE, JULY, AND AUGUST.

Area	Uncorrected	Corrected (a)
State	.9774	.9582
4	.9840	.9659
9	.9566	.9159
11	.9491	.8927

(a) The formula used was:

$$\bar{P}^2_{1,2345678} = 1 - \left[\frac{\bar{S}^2_{1,f(2345678)}}{\sigma_1^2} \cdot \frac{N-1}{N} \right] \qquad (5)$$

Area 4 shows the highest index of multiple correlation followed by the state, area 9, and area 11. After correction, the coefficients of determination are now .918 for the state; .933 for area 4; .839 for area 9; and .797 for area 11. The greatest improvement in closeness of relationship was in area 11 followed by area 4. In the case of the lowest correlation (area 11) only 79.7 per cent of the variation in yield is accounted for by the factors involved while in the case of area 4, 93.3 per cent is accounted for.

The curves indicating the net relation between yield and each independent factor are shown in Figure 3. The net relation of corn yield (in per cent of trend) to July rainfall is first shown. The net relation to other factors are shown as corrections from the yield indicated by July rainfall.

The most important observations to be made in connection with these curves are that those for rainfall in June, July, and August are generally upward, while those for temperature are downward. However, the curve for June rainfall in area 4 is downward over a considerable range, indicating that too much rain may be detrimental. July rainfall is the most important for the state as a whole and for area 4, and is important in all areas. July temperature is the most important factor in areas 9 and 11. The increase in steepness of the temperature curves in June and July from area 4 through 9 to 11 indicating the more rapid decrease in yield with higher temperatures toward the western part of the state is an important point. The curves for May rainfall slope downward for the state and areas 4 and 9, but upward for area 11. In area 4 the curve indicates that the temperature is sometimes too low in July for best results, although throughout most of its range it slopes downward. Rainfall much above normal seems to have little beneficial effect for most months even in the western part of the state.

That the rainfall and temperature account for so large a proportion of the variation in corn yield when these are averaged

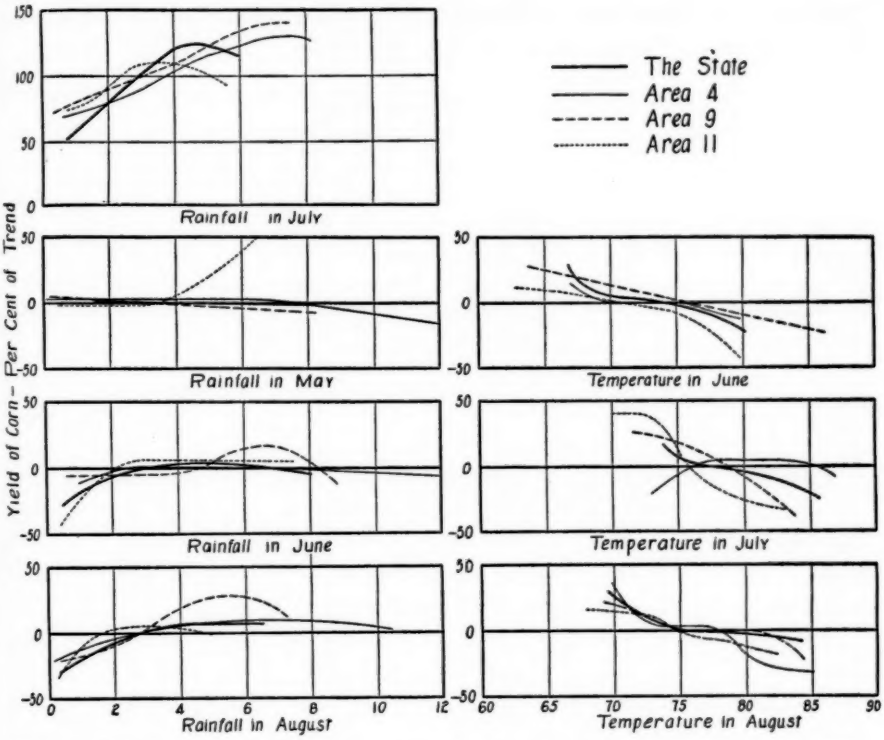

FIG. 3. Relation of yield of corn in per cent of trend to rainfall in May, June, July, and August and temperature in June, July, and August.

for the state as a whole, or by type of farming areas, is at first surprising. On a particular field, the yield is not only due to these factors, but to a number of others. The type of soil, the methods of culture, the variety of corn used, and the insects and diseases encountered are only a few controlling factors which might be mentioned. In the larger areas these tend to cancel out. In a particular type of farming area they also tend to be more uniform than for the state as a whole. Exceptional hazards such as hail are rarely general over a large area but if the relationships were worked out for small areas these exceptional hazards would affect the results materially.

Reliability of Linear and Curvilinear Results

A comparison of the closeness of relationship worked out by linear and curvilinear methods may be shown by a comparison of the standard deviations of the corn yield with standard errors of

estimate of the linear regression equations and the net regression curves. Such a comparison is shown in table 5.

TABLE 5.—STANDARD DEVIATION OF THE X_1's AND STANDARD ERROR OF ESTIMATE IN PER CENT OF TREND.

Area	Standard dev. of X_1	Standard error of estimate (a)	
		Linear	Curvilinear
State	37.34	21.85	10.84
4	30.20	21.72	7.93
9	48.68	27.99	20.35
11	56.91	41.90	26.08

(a) These have been corrected for the constants in the regression equation, the number for the curvilinear analysis having been approximated. The corrections were as follows:

$$\bar{S}^2_{1,2345678} = \sigma_1^2(1 - \bar{R}^2_{1,2345678})\left(\frac{N}{N-1}\right) \text{ and } \bar{S}^2_{1,f(2345678)} = \frac{\sigma_x^2 \cdot f(2345678)}{1 - \frac{M}{N}} \qquad (5)$$

The estimates in per cent of trend from the net regression curves may be multiplied by the ordinates of trend for corresponding years and the estimates thus reduced to bushels. This was done in all cases and the results for areas 4 and 11 are plotted in figure 4, together with the actual yields.

The estimates were most accurate for area 4 and least accurate for area 11. This has already been indicated by the indexes of multiple correlation (P's) and standard errors of estimate. An examination of conditions for the years having the largest errors will be illuminating.

Unusual Years

In 1895, after a spring rainfall not far from normal, the precipitation in June, July, and August were all considerably above normal. Temperatures were above normal in May, June and August and below normal in July. Estimates of yield based on these figures proved far too high. This indicates that when there is a series of months with rainfall above normal the rainfall for any month may not have as great an effect as when moisture is deficient.

In 1926, conditions were somewhat reversed. "The year, 1926, was chiefly remarkable in Kansas for heavy precipitation in the southeastern part of the state and severe and prolonged drought in the northwest quarter.... Beginning with April, the precipitation was below normal for five successive months, making the eight months ending with August drier than the corresponding period of any other year on record, except 1894 and 1913." *(2)* The estimates were too high for the state and especially for area

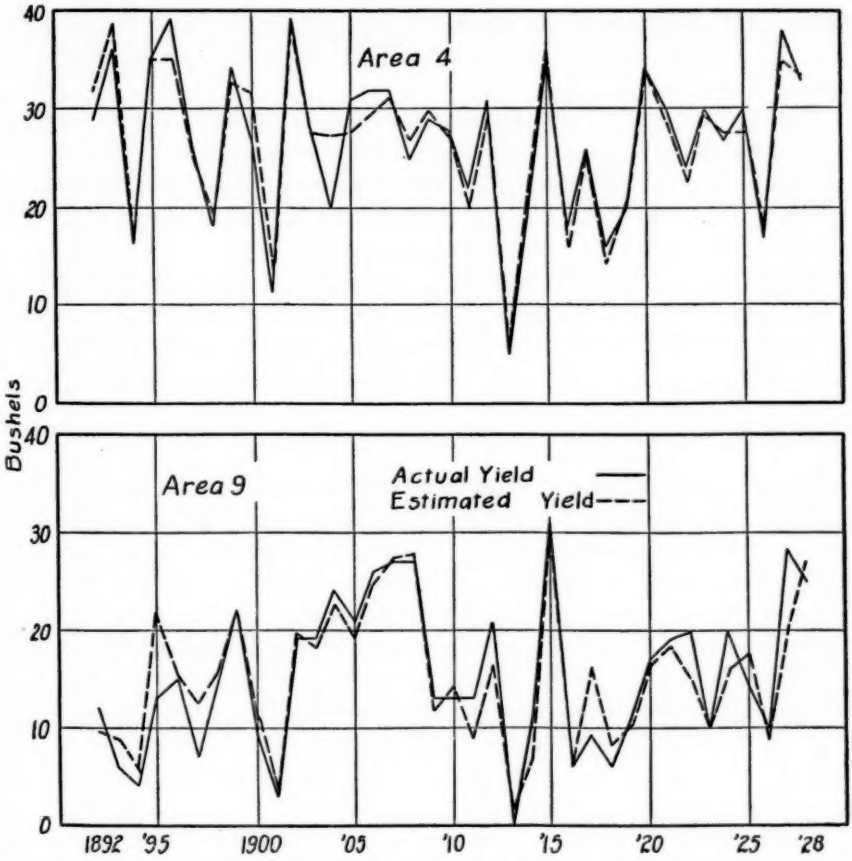

FIG. 4. The actual yield of corn in bushels and the estimated yield from the curvilinear relationships of rainfall and temperature.

11. This indicates that during a cumulative drought the rain that does fall may have a less effect than would normally be expected. A further complicating factor was that the latter part of July and the first part of August were dry. Thus, there was a longer drought than is indicated by the average precipitation for the two months. In area 11, the average precipitation recorded for July, 1926, is somewhat misleading due to a comparatively heavy rainfall reported at St. Francis but not recorded by the other stations of the area.

The year 1917 offers a little different variation. In the state as a whole but especially in areas 9 and 11, the estimates for 1917 were too high. There was a cumulative drought especially disastrous in the west. The corn was practically beyond recovery

before the August rains came so that while part of the yield is usually attributable to August rainfall it was of no avail this particular year.

The year 1927 offers somewhat of a contrast. June rainfall was considerably above normal but July was only slightly above normal. August rainfall was more than double the normal and was well distributed. The corn crop was late so these rains had a greater effect than is normally expected.

While many variations occur, those most likely to throw the estimates off seem to be covered in the examples given. Unusual or periodical occurrences such as hail, insect pests, etc. over a wide area might also cause estimates higher than actual yields.

Significance of Results

These results appear of some significence from several standpoints. In the first place they show that rainfall and temperature may have quite different effects in different type of farming areas. As type of farming areas are based partly on weather factors, this tends to show the justification and need of such a classification. If similar relations are worked out for other crops it will also help to show the comparative advantage of the particular crops for a type of farming area. It is further believed that the relationship between other important factors and yields might be worked out, which would help to determine type of farming areas more accurately.

The most widespread use made of such results is in attempting to forecast yields. For example, "Moore has had much success in forecasting the yields of cotton. Using methods analogous to those he had developed for cotton, he was able to forecast the yield for wheat, barley, and oats in the Dakotas more accurately than the United States Department of Agriculture in eight cases out of nine. In the single case in which the Department of Agriculture was more accurate, its forecast was made within a fortnight of the harvest. Hooker was able to get very good results for wheat in eastern England. Wallen obtained satisfactory agreement with official estimates of yield for the different provinces of Sweden, even though his basic data left much to be desired." (1)

While the results presented in the present article do not show as close relationships in all cases as might be desirable for forecasting purposes it is believed that they might be of material assistance in making estimates. The results which might be ex-

pected are shown in Table 6 in so far as can be indicated by the standard error of estimate. These are given for July 1, August 1, and September 1.

TABLE 6.—THE CALCULATED RELIABILITY OF ESTIMATES ON SPECIFIED DATES EXPRESSED IN PER CENT OF TREND.

Area	Standard errors of estimate (a)		
	July 1	August 1	September 1
The State	23.96	14.05	10.84
4	21.69	15.52	7.93
9	26.48	20.61	20.35
11	30.14	27.83	26.08

(a) These have been corrected for the approximate number of constants in the curvilinear analysis by the formula, see note to table 5.

Taking the state as a whole the standard error of estimate (in per cent of trend) is 23.96 for July 1; 14.05 for August 1; and 10.84 for September 1. The trend yield in 1928 was 17.1 bushels, so the standard error of estimate applied to that year would be ± 4.1 bushels for July 1; ± 2.4 bushels for August 1; and ± 1.9 bushels for September 1. The August 1 estimate for area 4 would not be quite so good as for the state as a whole but it would be better for July and September 1.

Since the data only to 1928 were used in the analysis, an estimate for the corn yield for the years 1929 and 1930 may be made for the state by way of illustration. Estimates of the yields from the net regression curves may be compared with estimates reported in Crops and Markets. These are shown in Table 7.

TABLE 7.—A COMPARISON OF ESTIMATES MADE FROM THE NET REGRESSION CURVES WITH CROP REPORTS.

Month	1929		1930	
	Net regression curves	Crop Reports	Net regression curves	Crop Reports
	(a)			
July 1	19.4±4.1 bu.	18.7 bu.	19.9±4.1 bu.	20.5
August 1	19.5±2.4 "	19.9 "	12.3±2.4 "	12.0
Sept. 1	18.4±1.8 "	15.0 "	11.9±1.8 "	12.0
Dec. 1		17.5 "		12.0

(a) Standard error of estimate reduced to bushels.

This comparison is favorable to the estimates from the curves. In 1929 the results were fair throughout. In 1930 the severe drought in July cut the yield considerably below the July 1 estimate. Both September 1 estimates are somewhat better than can be normally expected. The conditions in these years were rather favorable for such estimates. In 1929 the yield was close to the trend yield. In other words, all factors were fairly close to nor-

mal and so easier to estimate. In 1930 the cause of the low yield was the drought in July where correlation is higher than in other months.

In unusual years it appears that the unusual conditions might be taken into consideration in connection with the curve readings. In this way fair results should be obtained.

APPENDIX

The biennial and quarterly reports of the Kansas State Board of Agriculture were used as the source of the corn yield data. A simple average of the county yields was used for the area average. The county yields weighted by acreage might have given slightly better results. However, the variations in the same type of farming areas are less than if these counties were not so grouped. The temperature and rainfall data were secured from reports of the U. S. Weather Bureau.

The climatological data by areas have some shortcomings. In area 4 the stations used seem to be quite representative. In area 9 the stations are in the central portion of the area where corn is of most importance. However a little better distribution would be desirable if stations located in the area had sufficiently long records. In area 11 there is only one station with a fairly good record over the whole period. Other stations were added as the data became available. By adding these stations the relationships may have been affected to some extent.

That the additive relationship of the factors assumed in the method is not always exact has been pointed out by Ezekiel (4). For example, the effect of July and August rainfall may be different for different rainfall in June or the effect of June rainfall may be changed by variations in the other factors. An adaptation of the method suggested by Ezekiel has also been worked out by Waugh (15) in forecasting potato yields by early and late rainfall. He found the effect of each varied with variations in the other.

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NOTES

CONGESTED FRONTIERS AND DESOLATE SUBURBS

Professor Carver, in the JOURNAL OF FARM ECONOMICS of April, 1929, called attention to "our congested frontier" and to certain unwise governmental policies connected with it. It remained for the Truck Farmers' Association of Cook County, Illinois, to call attention to the conditions in some of our "desolated suburbs"; and one element of government policy associated therewith affords an interesting counterpart to the problem discussed by Professor Carver.

In terms of value of product, Cook County is one of the most important "agricultural counties" in Illinois, notwithstanding the intrusion of Chicago, Cicero, Evanston, and other obstacles to ideal farming conditions in this vicinity. One of the ways in which Chicago has obstructed agricultural production is in the extent to which its political and financial troubles have aggravated the governmental difficulties of the county and other local jurisdictions, resulting, in the past few years, in greatly increased taxes and assessments. The farmers in the 30 townships of the county outside of Chicago felt that their farm lands were assessed at excessive rates, as compared with other types of land; and about a year ago the Truck Farmers' Association asked the Institute for Economic Research, at Northwestern University, to investigate the whole subject of valuation of agricultural land in suburban areas. The truck farmers were ready to concede any reasonable valuation on the basis of agricultural use and to recognize some element of potential suburban value besides. The problem was to determine the thickness of this stratum of prospective urban value, superimposed upon the substratum of agricultural value.

Research students in this field will appreciate the difficulties of such a problem—difficulties so fundamental, indeed, that we have held out no assurance of being able to solve them. Most of the ordinary indexes of value are ruled out, either by the nature of the problem or by abnormal conditions existing in the real estate field at the present time. Any consideration of income was eliminated at the outset by the fact that the present income from this land is solely agricultural income, whereas the problem is to determine what value these lands have in addition to their agricultural value. Sale prices for the period 1924-1928 were examined; but it is apparent that sale prices during this period have no more relation to present values in these sections than the price of wheat in the same period has to the present value of wheat. The deflation of suburban land values, in fact, has been more severe than that of wheat. An effort was made to secure current sales; but in the present state of stagnation in the real estate market, it has been impossible to secure a sufficient number of sales in any section to afford any indication of land values. A considerable amount of expert professional opinion was consulted only to find that at the present moment there is virtually no such thing. A few real estate men are still talking of the World's Fair in 1933 and anticipate a reasonably early recovery of values. Most of them are extremely dubious with respect both to the time and extent of recovery. We have found no one of standing in the real estate field who anticipates the re-establishment of previously prevailing values throughout most of this territory within any predictable period. We experimented with the possibilities of constructing "normal" trends from historical data on the movement of land values in other urban areas, particularly after periods of "boom" and depression. It is obvious that there are no such trends and that one thing is about as "normal" as another.

We were compelled, therefore, to fall back upon the basic elements of land value—population, available area, carrying costs, and investment principles—in an effort

to determine the range of reasonably anticipated values, and particularly such range of values as an assessor can reasonably *compel* a property holder to anticipate in the payment of taxes. The elements involved in this process include, for the county as a whole and for various single townships in the county, the following:

Total area.

Deductions for public property, railroads, cemeteries, etc.

Remaining area available for utilization.

Number and estimated area of improved lots.

Number and estimated area of subdivided but vacant lots.

Acreage of unsubdivided lands.

Total area available for future occupancy.

Present population.

Population density per improved lot-acre in urban areas at present time.

Prospective rate of population increase (estimates of Chicago Regional Plan Commission), projected to 1960.

Value of improved-lot-acreage in developed *urban* sections at present time (average of 24 cities and villages in Cook County).

Developmental costs for streets, utilities, etc.

Interest, taxes, and carrying charges.

Application of actuarial factors.

Agricultural income over the investment period.

Discounting urban value, as of 1960, back to basis of present worth.

It is much the same type of computation that a large investment syndicate would make in projecting a long-term investment program, with some refinements and some variations on account of the nature of this particular problem. It is entirely divorced, for example, from any process of income capitalization, being anchored to market value in occupied urban areas at the present time, which is then projected, skyrocket fashion, down to 1960, discounted back up the line again, corrected for increments and deductions along the way, and subjected throughout to actuarial factors derived from ratios of population to available areas. In this computation, furthermore, all of the purely business costs—promotion, sales, advertising, and organization expenses—have been excluded, for reasons which we need not go into here, but with the result that the figures finally reached must represent the *maximums* that can be reached by any rational investment process.

The basic facts have been accumulated and the statistical computations made by Mr. John E. Burton, of the Institute. This work has now been completed, and the results, it is hoped, will be available for publication in a short time.

Our tentative results, from the standpoint of assessment, indicate a blanket figure of approximately $650 per acre for one township in which vacant land is assessed at the present time at from $1,200 to $1,500 (full value) per acre. We arrive at a general "control" figure of $550 for another township, which is now assessed at $1,000 to $1,200 per acre. These figures are intended, of course, to serve only as a kind of general index of land values in the various sections.

More important than these figures themselves are the "by-products" derived in the process—by-products that have to do with land utilization and land policy. In one township we find that the number of lots now subdivided is such that even if population continues to increase at the rate of the Regional Plan Commission's estimate, there will be some 3,000 lots still unsold in 1960, with enough room for 55,000 more lots on land which at the present moment is still unsubdivided. In another township, even if the estimated population increase materializes, there will still be some 10,000 vacant lots in 1960, left over from vintages of 1928 and from

still more primitive periods. Population will have to increase at approximately *twice* the estimated rate in order to absorb present subdivisions by 1960!

Perhaps we need not worry about 1960, but what will be happening between now and 1960? In one township, 4,000 acres of level prairie soil, cleared by the hardy labor of settlers of 100 years ago, has now gone back to stakes, crumbling sidewalks, and muddy embankments. The consequence is that thousands of acres of the finest agricultural land all over the county are taken out of agricultural production and consigned to idleness for decades to come. We speak of land "ripening" into higher uses; this is putting land into cold storage—and loading the community with the "frozen" assets that result. And in Cook County it proves that one factor, at least, in bringing about this situation has been the system of assessment.

A few years ago, when taxes were lower and real estate values advancing rapidly, these entire sections were assessed practically on an agricultural basis. The result was virtually a premium upon subdivision in the case of lands situated anywhere within the penumbra of urban influence. A representative of one of the largest real estate firms in the county said, not many years ago, in answer to a question about taxes as a cost of real estate development, "Oh, we don't figure on taxes at all." Later, when local governments were pressing for more revenue and taxes were mounting, whole sections was assessed, again virtually at blanket figures, on the assumption that this was all suburban area with prospects of early sale for subdivision purposes. This placed a penalty on continuance of agricultural operations, a penalty that is still being carried. The net result of this assessment policy has been, therefore, to subsidize subdivision and to penalize agricultural use of this land.

In the present agricultural situation, a reduction of acreage somewhere is desirable. But where should the reduction take place? Four thousand acres of good soil in one township in Cook County, if measured in terms of profit to the farmer, value of product to the consumer, and the amount of labor and cost involved in securing it, will produce as much as whole counties in northern Michigan or in the dry-farming areas of Montana and other regions that Professor Carver had in mind. Those are sub-marginal regions, at the bottom of the scale of productivity; agricultural land in Cook County, from the standpoint of soil, situation, markets, and prices, is at the top. Here, then, we have the extensive and intensive margins, with a deliberate government policy operating on both margins—and wrong at both. How wrong, we can readily apprehend by supposing that these policies had been reversed; that all the farmers who were encouraged to settle on cut-over, dry-farming, and other sub-marginal farms had instead been urged by the federal and state governments *to go to Chicago;* that, once there, the county government had subsidized them to farm most of the present subdivision areas. How much happier everybody would be now—the farmers, the consumers, the subdividers, and the lot buyers!

In Cook County we are recommending a simple method for establishing a sound policy, namely, a classification of lands, not for different rates of taxation (which would be unconstitutional and of questionable wisdom otherwise) but for purposes merely of accuracy of assessment. On the basis of the facts involved in our study, three clear classifications can be set up:

1. Occupied urban areas, assessed on the basis of established urban uses.
2. Subdivided areas, assessed on the assumption of prospective urban absorption over a reasonable investment period.
3. Lands whose "highest and best use," as far as any one can now see, will consist in raising cabbages and pickles for the next forty years, and which should be assessed solely on the basis of their value in such use.

Assessment on such a basis, promptly revised whenever new acreage is subdivided, would be a strong deterrent to premature and reckless subdivision; and would afford an element of assurance and stability in agricultural operations that is now lacking. The above classification has been mapped out, for illustrative purposes, in the case of one of the townships studied; and the complete results of the study have been presented to the Board of Review of Cook County. Such a classification is, of course, a commonplace to students of taxation. Our only contribution, if any, is that of deriving the facts on which to base the actual classification.

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THE NEW ENGLAND PROGRAM OF RESEARCH IN DAIRY ECONOMICS

Receipts from the sale of milk products constitutes the most important source of income to most New England farmers, and dairying ranks with the leaders among New England industries. The New England Council on Agriculture and Food Supply, an organization set up to coordinate and plan the agricultural economics research of this section and to serve as a clearing-house for the exchange of ideas, at its annual meeting, November 6, 1928, appointed a committee to formulate a program for dairy economic research. This committee was made up of H. P. Young of Vermont, A. E. Cance of Massachusetts, I. G. Davis of Connecticut, and F. V. Waugh, Secretary of the Council. The committee has not had authority to dictate to any institution what research it should undertake or how it should conduct research. It has simply outlined a long-time program of dairy economic research which the secretary of the Council will assist in carrying out as opportunity offers.

The aim of this program is two-fold: first, to determine the facts concerning supply and consumption which are necessary as the basis of a public policy which will insure an adequate milk supply; second, to determine facts which will assist the New England dairymen in maintaining selling prices and production costs at profitable levels.

Five general classes of studies were included in the program, as follows:

I. Farm Management on Dairy Farms

Most of the New England agricultural colleges have carried on farm organization studies of dairy farms, but the committee feels that further work should be done in correlating these studies so as to give the results more publicity and wider application.

Also research in cooperation with agronomists is needed on pasture usage. Lowering the cost of feeding cows is looked upon as one of the most pressing problems in New England. Farm management research already completed shows that the percentage of leguminous roughage in the hay fed to cows is one of the most important factors in reducing costs of milk production and raising incomes. Studies of the adaptability of soils to production of legumes have been started in Vermont.

The outline also stresses the need for more farm management research as to seasonality of production, as to the place of cream production in New England dairy economy, and as to land utilization with special reference to sections capable of expanding dairy production economically.

II. Studies of Demand

The research program along the lines of demand for milk includes buying habits of consumers, the effect of unemployment on demand, and the demand for milk in cities outside of New England.

III. Studies of Supply

Under this head are included studies designed to provide a basis for predicting probable future supplies of milk and cream, with special reference to the price of purchased feed; and studies of the supplies of milk or cream for our markets from competing territories and under varying prices; and studies of the dairy cow replacement problem.

IV. Price Policies of Farm Organizations

The New England Milk Producers Association has a known price policy in its classified price plan. Independent cooperatives cut under this price by from one-half cent to one cent per quart in order to avoid having to sell their surplus at lower prices for sweet cream or butter purposes. Probably no other phase of New England dairying contributes so heavily towards low farm prices for milk as does the maze of unequal and uncorrelated prices in the market. Here is a real challenge to dairy economics research workers in New England.

V. Manufacturing and Milk Distribution Costs, Conditions and Problems

Country plant handling costs vary from less than 20 cents to over 50 cents per 100 pounds of milk in different plants. How can the costs be cut down? Equally as great differences in efficiency apparently exist in city distribution. Little has been done to throw light on these problems.

The committee is now considering especially the problems of sound marketing policy for farmers' cooperative milk marketing organizations. Some agricultural leaders preach control of milk from the farm to the consumer's door. What, however, shall be said of selling to a dealer and also competing with him for customers? Laboratory material for research on this question is at hand in New England and a series of studies along this line will be incorporated in the New England dairy economics research program at the next annual meeting.

In conclusion, it seems clear that the program has already stimulated much new research and has contributed largely to coordinating and widening the interest in dairy economics research in the six New England states.

H. P. Young

University of Vermont

THE NEW ENGLAND AGRICULTURAL OUTLOOK CONFERENCE

The regional outlook conference is a new development in most sections of the country. In New England such conferences have been held for a number of years and reports have been printed and distributed for five years. The conferences are sponsored by the New England Research Council on Marketing and Food Supply and are attended by delegates from the agricultural experiment stations, extension services, and teaching departments of the colleges and by representatives of the federal and state departments of agriculture, marketing officials and farmers' organizations.

The 1931 conference was held in Boston on February 9 and 10, two weeks after the national outlook conference at the U. S. Bureau of Agricultural Economics. About seventy-five delegates attended the conference. A four-page report was prepared, printed, and distributed covering the outlook for dairy products, poultry products, potatoes, fruit, vegetables, and cigar-leaf tobacco. In addition to the short printed statement, the committees on vegetables and tobacco prepared longer

and more detailed statements for distribution to smaller groups of farmers especially interested in these commodities.

Maine, Vermont, Massachusetts, and Connecticut all held state outlook meetings within two weeks of the date of the New England conference. The purpose of the state meetings was to localize still further the outlook material and to consider adjustments that could be made to meet the prospective market conditions.

Since the New England group has had five years of experience in the holding of outlook conferences, the general methods used might be of some interest to other regions. Our experience in New England has been that a successful outlook conference depends mainly on our ability to effectively organize our facts and data beforehand. In the case of our own region, at least, we need not only data on the national and international situation, but we need local, New England, facts and statistics. It is our experience that a good New England report cannot possibly be prepared on the basis of national information alone or on the basis of local information alone but must be based on careful consideration of all elements in the situation, both national and local.

It follows that the state workers in New England must do a good deal of work in preparation for the outlook conferences. The preparatory work is organized six months or so in advance of the actual conference. Commodity outlook committees are appointed and a chairman of each is designated to assemble the data. The first job of each committee is to list the important questions which its part of the outlook report should answer. This is important, for the committee that prepares a complete list of questions considerably in advance of the actual conference has a relatively easy task to prepare its report. The next job is to make an inventory of the facts that are available to answer each of the questions on the list. In spite of the previous assembling of facts, we always find that some additional information must be gathered. Various committee members are then assigned to locate such information. Each New England state sends representatives to the national outlook conference in Washington, which gives many committee members the opportunity to find the necessary information in the various divisions of the U. S. Bureau of Agricultural Economics.

The committees meet at the time of the conference. They take up each question on the lists, discuss the national and local facts bearing on each question, and then write reports. These reports are submitted the following day to the general conference for discussion and possible modification.

In 1930, a supplementary dairy outlook report was prepared the following August. This year there is a great deal of interest in preparing such supplementary reports on dairy products, poultry products, apples, and possibly some other products. These later outlook reports would serve as a basis for marketing programs in much the same way that the present reports serve as a basis for production programs.

There is also considerable interest in the possibility of working out a regional extension program in connection with outlook work. Such a program would be concerned with determining the adjustments that might profitably be made to meet the market outlook and with making plans for helping to bring about such adjustments. Nothing of the kind, on a regional basis, has yet been done in New England. We have an effective organization for preparing outlook information and for writing reports, for a check-up on the accuracy of the New England reports during the past five years gives a batting average conservatively figured at 87.5 per cent. But we could do much more than we have yet attempted in the way of applying these reports.

Frederick V. Waugh

U. S. Bureau of Agricultural Economics

FARMERS' LEAGUE IN BELGIUM, OR "BOERENBOND"

The Boerenbond was founded July 20, 1890, by a Catholic priest, together with Mr. G. Helleputte, later a prominent figure in the Belgian Catholic party, and F. Schollaert, for the purpose of providing moral rather than economic support for the rural class in Belgium, much in trouble at that time.

The growing importance of the Boerenbond may be witnessed by the following figures:

	Local Organization Affiliated	*Individual Membership*[1]
1895	200	10,275
1900	336	19,000
1905	430	31,586
1910	531	44,522
1914	607	56,246
1919	679	60,264
1920	951	87,384
1925	1,150	109,737
1929	1,218	128,788

The change in the ratio of increase following the World War might be explained by

1. Decrease of risks attached to membership: the organization still holds all members responsible for any credit that might have been extended to one of them (Raiffeisen System), but the tremendous development of its financial power has definitely removed any chance for such a clause ever to work.

2. Increase in advantages: development of technical aid of every kind.

The Boerenbond has come to be the most important factor in Agricultural Belgium, outgrowing not only any and all of other attempts made towards organization, but the Government Department of Agriculture itself; and although the membership fee is but $1.50 a year (before 1928, it was but 10c), it ranks fourth amongst the Belgian Banking Concerns, with deposits well over 72 million dollars, and highly valuable assets.

The Boerenbond consists of the following administrative units:

1. *The Supreme Council,* meeting four times a year, for hearings on the general policy followed, and most important steps to be taken towards further development and extension. With the Supreme Council lies the supreme authority, which it vests in itself. The organization is not a Federation of pre-existing local associations, since the central ruling body is all-powerful on the question whether local associations will be allowed to join or not and to send a delegate to the Supreme Council or not. The Supreme Council is not composed exclusively of such delegates.

2. *Administrative board,* chosen by and from the Supreme Council, which attends to current business.

3. *General yearly meeting,* for the purpose of bringing together as many members and delegates as possible, submitting to them the annual report and hearing complaints or receiving suggestions.

4. *General Secretary's Office,* the outstanding working agency in the whole organization. This office is conceived as the administrative center for such activities as have not reached a stage that justifies an independent administrative center; and as the supervisory body for the independent departments. The independent bodies now set up are as follows: on the social side, the Belgian Farmers' Wives' Associa-

[1] These figures include only the actual heads of households, other members of it being included in different organizations.

tion; and on the technical side, the Horticulturist's General Association, the Inspection Service, and Technical Service, including the Belgian Society for Pasturelands Maintenance and Improvement, the Buying and Selling Cooperative, the Central Organization for Credit, and the Insurance Corporation.

Be it emphasized once and for all that the organization still maintains its confessional character: to be actually a Roman Catholic is a *sine qua non* condition for membership, and the organization concerns itself with the moral and social betterment of its members much more than with their economic welfare. As for the financial development, it came along with the ever-growing deposits made by the ever wealthier farmers, and is but a sideline of the general program.

The social work of the Boerenbond that is inside the General Secretary's Office and wholly commended to its immediate care, may be classified as follows:

I. *Organization activities:*
   1. Local farmers' associations: the main factor in the organization at large, and therefore retained under direct leadership.
   2. Young farmers' associations: part of the local associations where these are to be found, and enlisting the young men not eligible for membership as not being household heads.
   3. District associations: with a political purpose.

II. *Religious and social activities:*
   Periodicals, sermons, and even pilgrimages to Rome.

III. *Political activities:*
   Legislation concerning rents and leases, taxation, war damages still to settle, military service, housing, old age insurance, and flood damages.

The only independent social organization which is under the supervision of the Secretary General's Office is the Farmers' Wives' Association, modeled upon the Farmers' Association, whose membership increased from 11,934 in 1914 to 65,952 in 1929 for household heads; and from 15,041 to 90,116 for all other members.

The technical services of the Boerenbond which are conducted inside the General Secretary's Office and wholly commended to its immediate care, may be classified as:

1. Technical instruction and vocational guidance, taking the form of publishing periodicals—"The Farmer" issued in Flemish, French, and German, and several others—and technical pamphlets concerning better methods in farm management, horticulture, dairy and poultry farming, cattle breeding, etc.; of providing lectures—6,000 were delivered in 1929, of which 1,500 concerned technical questions; of holding research conferences once a year—in 1929 the most important questions studied were marketing and credit; of giving regular courses in farm management and gardening; of arranging exhibitions and shows; and of maintaining technical libraries.
2. Research services relating to crop improvement and cattle breed improvement.

The technical services which are provided by independent organizations, but supervised by the Boerenbond, are those of:

(1) The Horticulturists' General Association,
(2) The Inspection Service,
(3) The Technical Services relating to planning of buildings, electric power and light, irrigation, and pastureland maintenance and improvement.
(4) The Buying and Selling Cooperative, which is a very important branch in the general organization, working in connection with the 1,206 local cooperatives scattered throughout the country, which, however, have no obligation to refer matters to the central cooperative if they do not want to do so. The coopera-

tive purchasing in 1929 amounted to 203,000 tons of fertilizers, 202,000 tons of forage, 14,000 tons of grain, 52,000 tons of coal and miscellaneous items, and a large quantity of tools and machinery. The cooperative selling in 1929 amounted to 55,077 tons of potatoes, 1,366,383 kgs. of butter, 713 millions of eggs, besides vegetables, fruit, and grains. The balance sheet ran up to a total of $5,255,109, although the outstanding stock, which is owned by the Central Credit Organization, is but $428,571.

(5) The Central Organization for Credit, discussed below.

(6) The Insurance Corporation. Although allowed in its articles of incorporation to offer any kind of insurance policy, this corporation concerns itself merely with three kinds of insurance:

a. Fire.

1929, insured assets up to $200,000,000 for policies outstanding: $106,262.
Premiums received—$420,000.
Premiums paid—$140,000.

b. Life.

Endowment capital insured, $5,400,000.
Outstanding policies: 4,179.
Income insured—$2,500.
Outstanding policies—33.

c. Accident.

The balance sheet for 1929 is as follows:
Capital (owned by the Central Credit Organization)—$140,000.
Paid up—$30,000.
Total Assets—$1,300,000.

Although we have already mentioned the Central Organization for Credit as being one of the important factors in the technical services of the Boerenbond, we have not revealed its full significance; particularly we have not mentioned several concerns, industrial as well as financial, whose relations with the Boerenbond come from the fact that it has gained control of them by investing part of its enormous assets in them. Although this part of the development of the Boerenbond is highly significant, it does not so stand in the eyes of the leaders, for they have emphasized very often the fact that their financial activities were conducted only under the stress of necessity. Nevertheless, the Central Credit Organization is the agency by which the Boerenbond has built its solid structure, and the source out of which rises its present towering financial power. This Central Credit Organization has resulted from the federation on a cooperative basis of the local saving and lending institutions, built on the Raiffeisen plan, and working as cooperatives. The Central Organization has taken care of the surpluses of these local institutions and has extended them credit. It has also received time deposits from individuals, and has a separate department providing for credits on land mortgages. Out of 1,490 local credit institutions functioning in Belgium, 1,050 are affiliated with the Central Credit Organization. The capital is composed of $30 shares, of which one is to be subscribed for each loan of $300, $3 only being paid up, so that it might be said that each extension of credit is covered by a part-payment amounting to one-hundredth of the credit extended.

The development of the organization since 1897[2] is indicated by the following data:

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[2] The figures are given in Belgian francs, because of the impossibility of translating their value into dollars during the inflation period.

	Time Deposits	*Call Deposits*
1897	$ 65,923	
1900	378,892	
1905	5,115,758	
1910	11,983,201	
1915	22,723,861	
1917	1,334,750	
1930	78,474,927	$150,331,522
1925	337,473,094	317,540,426
1929	611,184,592	663,348,669

The bulk of the time deposits is composed of $595,762,564 frs. left with the Central Organization by the local cooperatives. The balance sheet for 1929 shows a total of 1,803,272,880 frs., the original paid-up capital being 7,454,800 frs., and the subscribed capital 67,093,200 frs.

No statement has ever been made public of the full holdings by the Central Organization in various industrial and financial concerns in Belgium.[3] The Central Organization first of all acquired some interests in industries related to agriculture, including sugar manufacturing, vegetable canning, meat canning, textile manufacturing, production of fertilizers, and colonial enterprises. Later came participations in less directly related enterprises, such as in the electrical field. Last, but not least, came an affiliation with an existing banking concern, the General Banking Association, which will probably allow the Central Organization for Credit to retain a more direct specialization in agricultural finance, the industrial and banking interests being handled by the General Banking Association.

As far as we can see, the Boerenbond actually controls total deposits amounting to over 2,500,000,000 francs, or $71,428,571, besides other valuable assets.

The technical structure of the organization seems in very good shape, and needs probably but little improvement. The whole machinery works with such a simplicity that one finds it difficult to comprehend, accustomed as one is to the intricate banking combinations commonly prevailing.

John J. de Stoop
Harvard University

THE FUNCTIONS OF MANAGEMENT AND STATISTICAL SERVICE IN A COMPARATIVE MARKETING ASSOCIATION

The cooperative marketing movement in America may well be thought of as having progressed to the second phase of the formative period of development. The first phase was one in which a great deal of trial and error occurred, and there was little widespread knowledge of the possibilities and limitations of this method of marketing. There now begins to emerge at the present time a more general understanding of fundamental principles and while the two phases of development shade into each other by imperceptible degrees and it is impossible to fix an exact time dividing these periods, it is nevertheless clear that there is a much better understanding of cooperative marketing principles than there was six to ten years ago.

One feature of the development that has interested the writer, especially in connection with the cooperative marketing of cotton, has been the progress made in differentiating between the functions of management and of statistical service. The experience in cotton marketing might easily have been duplicated in any other cooperative association, especially one handling a staple and non-perishable commodity.

[3] Baudhuin, A. Le Boerenbond Belge, Rev. Ec Intern. Janv., 1930. An excellent survey of the financial development of the Boerenbond.

Soon after the organization of the cooperative cotton marketing movement, it was seen that the success or failure of the movement depended more upon sales policies, including time of selling, than upon any other factor. This naturally brought to the fore the idea of price forecasting in connection with cotton selling. The Division of Statistical and Historical Research in the Bureau of Agricultural Economics, U. S. Department of Agriculture, had developed a formula and method of forecasting the average season price of cotton, and after some years of experience in hit-and-miss selling, the cooperatives, through the overhead organization, the American Cotton Growers' Exchange, adopted the idea of price forecasting as the basis for sales policies. The procedure worked out by the Division of Statistical and Historical Research was further refined and developed by the statisticians of the American Cotton Growers' Exchange. The development of the formula involved the use of multiple correlation in arriving at the relative weights of several price-determining factors. Fairly complete information over a period of about twenty years had been used by the Division of Statistical and Historical Research in arriving at the relative importance of these price-determining factors.

From a scientific standpoint the development of this formula must be regarded as an unusually good piece of work. The experience of the cotton cooperatives in the application of price forecasting to problems of selling brings out clearly, however, that there is a clear-cut and definite distinction between the responsibility involved in the job of price forecasting and that of selling the cotton of cooperative associations. The statistician who makes the forecasts is a trained specialist and might not make a good business manager. At any rate, the function of the latter belongs distinctly in another field. The business manager in making decisions as to sales policies must give full weight to the attitude and wishes of his members, their financial needs, the problem of maintaining the proper relations with his consuming customers, the question of carrying costs on the commodity, the fallibility of price forecasts, as well as the forecasts themselves. If he does not take into account these other factors involved, but hinges his entire program upon the infallibility of the latter, he in effect deserts his post as manager and by functioning as an accessory to the statistician exalts the latter to the position of manager in fact, though not in name. An association managed solely from the viewpoint of the price forecast will fail, and under these circumstances the statisticians, though he might be the best in his profession, is apt to be charged sooner or later with failure of the organization to satisfy its members.

The statistician himself if he knows his job, will recognize the limitations of price forecasting and its proper function much better than the average person. But he may be utterly unable to keep the management from not recognizing these limitations. It would therefore not be just to hold the statistician responsible for the outcome of a bad selling season unless it could be shown that he either miscalculated the facts available at the time the forecast was made, or unduly insisted that the selling policy be based exclusively upon forecasts, ignoring those other features of the problem that have an important bearing on the life of the association.

To over-emphasize the importance, in the cooperative scheme, of price forecasting and to base sales policies entirely on forecasts is probably as poor business management as to ignore price forecasting entirely. In either case the association is bound to come to grief. One of the tests of a successful manager in charge of an association which operates time pools is his ability to give proper weight to the price outlook in determining the sales program. Unless he can do this the association is apt to prove unsatisfactory to its members even though the highest type of statistical

service is provided. The point may be illustrated by suggesting what would happen to the business man who might employ such services as are offered by Brookmire, Babson's, etc., and base every business action on these services, ignoring individual and local factors that could not be taken into account by the service agencies. Even with a genius at the head of the service agency a business man following this procedure could not remain long in business. The difference between managment and statistical service is more clearly recognized now than formerly and a better understanding of the differing functions of each ought to be developed in the minds of cooperative association directors and members.

D. W. Watkins

Clemson College

THE CZECHOSLOVAC AGRICULTURAL ACADEMY

The Czechoslovac Agricultural Academy is an independent autonomous scientific institute located in Prague. Its aim is to help by scientific methods in the development of agriculture in Czechoslovakia, thus securing a normal existence for the state during the present unfavourable conditions of world competition. This year the Academy celebrated the fifth anniversary of its life. The head of the Academy is Dr. Hodza.

The Academy is divided into six sections, the names of which are: (a) agricultural; (b) forest; (c) vegetable, vine and garden; (d) agricultural industries; (e) economics; (f) literature and instruction. The Academy consists of honorary, regular, and corresponding members, now totaling over 440. During the five years the Academy in its general meetings, to say nothing of the work performed in single sections, has reported about 235 answers and prepared 30 statements concerning different questions. The Academy is now working very energetically on the solution of the present problems of Czechoslovac agriculture. It has arranged inquiries into wages and working conditions of the agricultural workmen, fertilizing and its agricultural importance, insurance against losses caused by hail storms and cattle epidemics, and influence of cold weather on garden vegetables.

The Academy makes scholarship endowments and subventions for scientific research as well as for the study of questions concerning agriculture. It also has a publishing program. First of all, it publishes under the auspices of Dr. Reich a periodical called "Věstník" (translated "Message"). This appears ten times a year and contains 120 pages. It handles scientific questions chiefly. Some of the sections of the Academy also publish reports and books on research in the different branches of agriculture. Among these publications we may mention the following: "Organization and Mutual Support Among Farmers as a Means of Solving the Agricultural Crisis," "The Agricultural Crisis from the International Standpoint," and "Rationalisation in Agriculture." "The Agricultural Problem in New Europe," by Mr. Strakosch is being prepared for print. Last but not least, the Academy has published ten textbooks for agriculture schools, and seven other textbooks are now being prepared for publishing. The Academy has organized the Central Slav Library, and is constantly increasing the number of books. The Academy intends to publish a series of books in the near future dealing with the development of a common terminology in agriculture, the organization of agricultural literature, dictionaries of gardening and forest economy, a complete agricultural encyclopedia, and a detailed agricultural history in Czechoslovakia.

The support of the Academy consists mostly of income derived from selling printed works, official donations (some also from the United States Government), and other subventions.

Although it is not even possible to foretell the end of the crisis, the Academy enters without fear the next five years of its life. If the Academy will work as intensively as it has up to the present it will approach its objective, i.e., the uniting of all intellectuals working in the sphere of agriculture in order to facilitate the realization of the reforms which are very necessary for the successful development of agriculture. The Academy will then reach the goal set by Professor Masaryk in the near future.

S. Borodaewsky

Praha, Czechoslovakia

BOOK REVIEWS

OUR FARM LIFE FICTION

By Caroline B. Sherman
Bureau of Agricultural Economics

In a recent book on rural sociology the novel and the novelist's methods are discussed as constituting one of the useful levels of study for the sociologist. The novelist's treatment necessarily tends to be almost exclusively subjective, but this method has the advantage of bringing complex situations clearly into view and such writing may suggest important topics for study in a more objective way, says the author. For completeness of presentation, some of these novelists "set a standard of excellence that the social scientist may well strive to attain." A member of a seminar in rural sociology in one of our largest universities has pointed out that Dickens' novels have long been regarded as important social studies, that Scott's work has always had significance for the historian, that Knut Hamsun is everywhere recognized as a significant interpreter for Norway. And here and there, at widely separated institutions during the last year or two, we have been finding graduate students in sociology who are turning to fiction for material on which to base their theses. One analyzes English novels for their depictions of family life; another analyzes American fiction for a similar purpose; another studies modern rural fiction critically to ascertain its contribution to social analysis.

Farm life fiction in America is ready for this challenge. Although its development has occurred practically within the last fifteen years, it now forms a school of writing that may well attract the attention of all who are interested in farm people, farm living, and rural problems of relationships and adjustments. Excluding mere frontier and wild west stories and limiting our definition to books devoted to life on the farm, we find that the movement seemed really to get under way only when Willa Cather began to publish her books with an encouraging regularity: *O Pioneers, Song of the Lark, My Antonia, One of Ours.* A few other writers began to contribute worthy volumes at about this time but not until 1920 did interest in farm life fiction become active. A little later this type of story came perilously near to being a fad, to the consternation of its long-time observers who were anxious to see it develop in the hands of those who combine a first-hand knowledge of the farm with a keen insight, a grasp of essential values, and an adequate knowledge of what constitutes good writing.

Among the many reasons for the increased interest in farm life fiction several seem evident. Abstract but potent were the tardy realizations among the American artists generally that the life and the materials best understood by them are the most likely, in their hands, to yield a satisfactory result than are the materials with which they are not fundamentally akin, and the penetrating influence that the Middle West was exerting on American art generally but particularly on fiction, as its creative writers began to come into their own. More concrete causes were found in the renewed emphasis on realism in fiction following the World War, in the later shift toward regionalism which brought the farm novel still more to the fore, in the avid interest in psychology and psychoanalysis which led to a search for so-called types of characters, and in the postwar depression in agriculture whose repercussions in all other walks of life stimulated interest in the conditions that affected all readers indirectly.

Perhaps the one factor that brought attention most sharply to rural fiction and tempted new writers was the surprising success of such books as measured by the somewhat doubtful device of prizes. The record of the fiction Pulitzer prize, for

several years, reads like the record of a rural award: To Willa Cather for *One of Ours* in 1923; to Margaret Wilson for *The Able McLaughlins* in 1924; to Edna Ferber for *So Big* in 1925; to Louis Bromfield for *Early Autumn* in 1927. The Pulitzer biographical award went to Hamlin Garland for his *Daughter of the Middle Border* in 1922. Awards from other sources have gone to Martha Ostenso for *Wild Geese,* to Glenway Wescott for *The Grandmothers,* to Mazo de la Roche for *Jalna,* and to Harriet Connor Brown for *Grandmother Brown's One Hundred Years.* (Both this book and the Garland border-life series are so closely related to the best farm life fiction that this Garland volume was announced by its publishers as fiction.) And it seems a reasonable prediction that the prize now being offered by the National Arts Club "that shall best interpret the Soul of America" will go to a writing that is rooted in the land.

Among the features that tend to differentiate good farm life fiction from other good fiction are: (1) The objectives of the leading characters are usually different and are rarely materialistic in the usual sense. Additional acres, a new house, advanced schooling for the children bring satisfactions but the deepest rewards come from deeper sources, as Swenson's progress in his experimentations toward the rust-resistant wheat in Mrs. Cannon's *Red Rust,* the work toward improvement of all farm conditions in Miss Scarborough's *Can't Get a Red Bird,* and the building up of a definite philosophy of life in Frederick's *Green Bush.* (2) The books are characterized by a sense of growth—in character development, in living things of the farm, in extent of acres, in community organization. This growth is especially exemplified by Quick's trilogy—*Vandermark's Folly, The Hawkeye,* and *The Invisible Woman*—which begins with the settlement of an Iowa corner, carries the story through the development of an organized county life, and finally deals in forthright fashion with the problems of the new and developing State. (3) Vocabulary, style, and figures of speech, are likely to be closely akin to the farm and to the rhythms of the seasons. These are among the distinguishing marks of a truly indigenous story; in a tale that is merely placed in a rural setting we are not likely to find this close knitting of scenes and style. (4) Between the leading characters and the soil there is usually a deep affinity. We find this in most of the best of the books and particularly in Miss Glasgow's *Barren Ground,* in *So Big,* in Rölvaag's *Giants in the Earth.*

The farm life fiction has come to a maturity that merits consideration is evidenced in many ways. Best of all, we can now demand as much of rural novels as of any other. There was a time when those who were interested in farm life welcomed any book that brought it before the public, but that is no longer necessary. We can now demand for farm life fiction strong characterization, insight, "savor," good literary style and craftsmanship. Then the relative stability and continuity in farm life means that this material lends itself to modified saga treatment: the very existence of such sequences as Garland's *Trail Maker* series and Quick's trilogy is evidenced of the substance and body and maturity of this material. There was a time when monotony seemed characteristic of these books but all kinds of treatment are now found within this school—the severely objective as in Ruth Suckow's *Country People;* the dramatic or melodramatic as in Miss Ostenso's books; the warmly subjective as in *Barren Ground* and *Green Bush;* the reportorial in the better sense as in *So Big;* and the telling of an idyl in lyric prose as in Hémon's *Maria Chapdelaine.*

Development evident among the writers themselves is perhaps one of our surest signs of maturity. Garland was at first bitter in his treatment of things on the farm but later became more mellow and worked from a better perspective; Miss Suckow is now leavening her material with a brief imagination; Miss Scarborough has grown from a somewhat sentimental viewpoint to almost too-literal transcription. Many dif-

ferent viewpoints are now represented: for instance, we see the immigrants and their reactions to American conditions as seen through American eyes, in *My Antonia;* we see American settlers through the eyes of immigrant settlers and the subjective revelation of the immigrants' response to American conditions and customs in *Giants in the Earth.* In fact, farm life fiction now covers a wide range in both subject and treatment.

The stories that are but thinly disguised vehicles for propaganda are not much more successful as literature in this field than in any other. Thus in *Can't Get a Red Bird* the first half, in which the author is painting in her background and developing her characters is well done, but in the last half, although our interest quickens as we seek to identify incidents and characters of recent agricultural history, our recognition of the book as a well-wrought novel wanes. Nor are they, as a rule, satisfactory to the real student of agriculture. Their usefulness undoubtedly comes in the hands of those who do not know farm life but do read fiction.

That good farm life fiction has an increasingly wide appeal is shown, not only by the prizes awarded, but by the fact that some of the books not so signalized have been among the best sellers for months at a time, and by the further fact that several years later publishers have found it profitable to bring out many of these books in reprint editions at low prices. Thus they have been in demand in libraries and bookstores year after year. Remembering the nature of most of these volumes it seems evident that universality of appeal is the explanation rather than any more superficial element of popularity. They interest even keenly critical minds if such minds are interested in people and human relationships. Thus one of our leading critics at the height of his influence on American letters acknowledged "an almost insatiable appetite" for the realistic novel that enlarges and quickens our consciousness of the world we live in—especially for the novels in which the characters, setting, and problems possess a genuine representative value.

Methods and Status of Scientific Research with Particular Application to the Social Sciences by Walter Earl Spahr, and Rinehart John Swenson, New York and London: Harper & Brothers. 1930. 533 pp. $4.00.

When Professor Walter E. Spahr, now of the Department of Economics of New York University, was a graduate student in political science at the University of Wisconsin, at the same time that the reviewer was a graduate student in economics there, the Department of Political Science, under the leadership of Professor Arnold B. Hall, was giving its graduate students a course in the handling of research materials, research procedure, and presentation of results. Professor Spahr was so much impressed with the value of this course that he later developed one of the same general nature at New York University. Out of this course was developed the present book on "Methods and Status of Scientific Research."

As now conceived, the course and the book are designed for college seniors as much as for graduate students. Out of his experience in giving this course, Professor Spahr has developed a strong belief that the training of all college students should stress less the learning of facts and much more the methods by which facts and scientific principles are tested. He probably favors giving all college students some formal training in research methodology. He should be quoted exactly on this point (p. 461):

"Colleges in general, especially when not a part of a university, are usually mere pumping stations, and during the conventional four-year undergraduate period of the student's life endeavor to pump as many facts into his head as his addled brain

can hold. The faculties, in the main, are interpreters of textbooks and funnels through which the materials of the college library are brought to bear upon the student. Rarely are the college students taught to find facts and almost never are they given a formal course in methods of research. If Karl Pearson should be correct that about ninety per cent of accumulated facts escape from one's mind, then it appears that nearly ninety per cent of the efforts spent in the undergraduate colleges are misdirected and the educational methods call for a reappraisal and overhauling. If it be true that the methods of finding facts and of solving problems are the most lasting and valuable parts of the educational processes which can be carried from college, then colleges must change their points of attack and emphasis; they must lay less stress upon fact accumulation and more upon principles, theories regarding problems, and the methodology of testing theories and of solving problems.''

The book as written contains six chapters at the start on ''the principles of critical scholarship which appear to be most generally acceptable among the leading scholars of the world,'' then five chapters on gathering data from libraries and from the field and analyzing and interpreting them, then two chapters on preparation of manuscripts, a useful chapter ''Plagiarism, Copyright, and Publication,'' and finally four chapters on the status and organization of research. Professor Swenson wrote only the five chapters dealing with the use of libraries and preparation of manuscripts. It will appear that considerable of the book is merely informational; but it is information that young research workers should have available. The chapters on use of libraries and preparation of manuscripts and proofreading will prove highly useful to beginners in research.

The reviewer would prefer to devote the rest of his space to the discussion of the ''principles of critical scholarship'' and methodology. He finds himself in complete sympathy with the authors' attitudes toward scholarship in the social sciences. It is highly important that young research workers be acquainted with the standards of good scholarships as outlined in this book. Agricultural economists need this more than most other social scientists because they commonly have less contact with good scholarship in their undergraduate days. To understand in what respects the reviewer would disagree with the authors, one need only to compare the table of contents of ''Research Method and Procedure in Agricultural Economics'' with that of the book under review. The former is more concerned with quantitative analysis, the latter more with qualitative; the former more with testing the validity of specific facts, the latter more with combination of facts and their interpretations; the former more with facts and data collected in the field, the latter more with material stored in libraries. To be sure, Professors Spahr and Swenson make strong statements as to the importance of quantitative analysis, even advocating that every student of the social sciences should be trained in statistics. For example, note the following statement (p. 276): ''The untrained never should use statistical data without the advice of some competent statistician.'' But little space is given to developing its philosophy and its place in social science research. In this respect, this new book is an excellent supplement to ''Research Method and Procedure,'' which admittedly is weak so far as qualitative method is concerned.

Professor Spahr really thinks of social science research in terms of an historian. He even goes so far as to say that most of the researches of social scientists are of an historical nature (p. 19), that the term historian will include most investigators in the social sciences (p. 7). One might divide all social science research into two categories, historical and geographical, dealing with variations in time and in space, respectively; but even then Professor Spahr's statement would not hold. As a matter

of common agreement, research is not historical merely because it deals with variations in time. Study of the factors affecting prices of wheat is not history merely because most of the variations revealing these factors occur in time sequence. If it were, then economics, political science, and sociology would vanish as separate sciences and become either history or geography. In keeping with his point of view as above outlined, Professor Spahr goes much more frequently to the writers on historical method for his ideas than to other sources.

A logical accompaniment of the foregoing is Professor Spahr's emphasis on *facts* as distinguished from *relationships*. He even defines truth as "verified fact" (p. 5), and then defines a fact as "an act, an event, a circumstance, or anything that comes to pass" (p. 2). Indeed many statements can be found which indicate that he recognizes that the truths in which mankind is really interested are matters of relationship, and not facts as such; but he gives several times as much space to discussing methods of testing facts as to the ways and means of discovering relationships and determining their probability.

Also in keeping with his essential historian's point of view, Professor Spahr looks to libraries and historical documents as the sources of most of his facts. His discussion of methods of collecting data in the field and analyzing them is brief and inadequate. Social science research is turning more and more to the field for its data for analysis. Hence one must describe the book in question as unbalanced in this respect.

Those interested in the case method will find in this book some interesting observations concerning it. The reviewer feels that Professor Spahr has not separated sufficiently in his mind the use of cases as instruments of teaching and the case method as a way of research.

John D. Black

Harvard University

Danger Spots in World Population by Warren S. Thompson. New York: Alfred A. Knopf. 1930. 343 pp. $3.00.

This book by one of America's foremost students of population problems, aims to bring to the attention of thinking people the "danger spots in population." By these are meant those areas on the earth of greatly different population pressures, as measured by the relation of people to resources. The author believes that there are three regions where the chief danger spots are located: (1) the western Pacific, (2) the Indian Ocean, and (3) central Europe, with Italy.

In the introductory chapter it is stated that the danger can be largely lessened by concessions on the part of the British and French empires and the Netherlands without doing any great damage to the standards of living of those countries. Basing his judgment on past events, the author holds out little hope that the abstract justice of the matter will greatly influence the nations who are interested in maintaining the *status quo* of land distribution in the world.

It is pointed out that economic factors in the broad sense have been preëminent in causing war, even though they have not always been the ostensible cause. Today, even more than in the past, changes are occurring not only in the population, but in the standards of living, industrial development, etc., of many peoples. Large blocks of the earth's surface have been appropriated in the past by the more aggressive nations for future use. Many of these regions with sparse populations and large potential resources lie close to the areas where the pressure of population upon resources is strong. Several of the nations in the danger spots arrived on the modern

stage too late in history to claim any of the unappropriated resources of the world. *Status quo* might exist for a long period of time were it not for the fact that these peoples who are "swarming" are beginning to feel the urge to demand a new deal at the hands of those who have passed through this growing stage. The latter now wish only to retain the fruits of their past exploits—exploits which were accomplished under a similar urge to expansion, but which is now outgrown.

From the introductory to the last paragraph the book is singularly free from prejudice and bias, and it can be truly said that the author has used the scientific method in dealing with a knotty and perhaps somewhat touchy problem in certain quarters. The entire reasoning is based upon an interpretation of a statistical study of the resources of the various areas of the globe. It is felt that only with such a basis of interpretation can the peace of the world be maintained and the welfare of all concerned be enhanced.

The first section considers the problems in the western Pacific, particularly those confronting Japan and China. Agricultural resources, mineral resources and industrialization are considered in relation to population. The author believes that China's population problem is not nearly so dangerous from the standpoint of world peace as that of Japan. The basis of this reasoning lies in the fact that the people of Japan are a unified, highly self-conscious people with "leaders who have learned the game of politics in the West and who are in a position to make demands with the full force of the nation behind them." With China it is a case of "a people not yet nationally conscious, quite unorganized, and without any unity and hence without recognized leaders." The author believes that the only hope for reducing the population pressure in China is effective birth control. It is pointed out that "a large emigration into French Indo-China from China would materially help to fill up the former, but would do nothing to decrease the numbers of the latter. China could send out several millions annually and still grow at home." Indo-China is not an "open" land in the sense that many of the larger islands in this region are.

With reference to the need of Japan for more land, the author makes specific suggestions. A considerable portion of a chapter is concerned with the discussion, "Who are the Japanese?" and conclusions are drawn to the effect that the Japanese seem well suited to tropical areas. With this in view it is suggested that the sparsely settled areas of the Dutch and British East Indies, tropical Australia, and a portion of the Philippines might be considered.

"Can War in the Pacific Be Avoided?" is the title of the concluding chapter in the first section of the book. The author concludes that if new lands are turned over to Japan, war will be avoided, otherwise he believes that sooner or later it will be inevitable. Incidentally, he believes that the United States does not have any great interest in preventing Japan's expansion in the western Pacific. An interesting comment in the section on the Malays is brought forward in which the view is expressed that if left without the tutelage of the Dutch and the Americans they would be submerged by the Japanese and the Chinese. It must be realized by the Japanese that even with their expansion "there will be no solution of the problem of population pressure in Japan or any other country if it is not accompanied by the practice of birth control."

The second section of the book deals with the problem of India and her teeming millions. "One need not argue the point as to whether there are more people in India than it can support. There are never more persons in an area than it can support. Their presence proves this. But there may be so many people living on the resources of any given area that with their mode of life they suffer want and privation and

are unable to withstand disease and protect themselves from its ravages. This is the condition in many parts of India today. . . .'' Little hope for improvement in India's situation by way of industrial development is entertained. First, the adjustment of population to a new method of production is an exceedingly difficult matter. Second, it is doubtful whether industrialization can be accomplished at all in India unless large emigration outlets are provided for those thrown out of work by the adoption of machines. ''Furthermore, India lacks a market, and modern industry, by itself, is powerless to create one.'' Both the Indians and the Chinese are right when they insist that modern industrialism cannot be transplanted bodily from the West to the East.

Definite suggestions are made that the Indian be allowed to populate the now sparsely populated areas in east Africa from Kenya Colony to South Africa and in addition the now thinly populated Madagascar. It is asserted that this portion of Africa has almost the same area as that of India and apparently contains twice as much good agricultural land as is now being tilled. The population is approximately one-seventeenth that of India. Various objections are raised to Indian settlement such as (1) the land is being held in trust for the negro by the white man, (2) the Indians tend to spread distrust of the British among the natives, (3) the Indians exploit the natives, (4) the Moslem Indians spread their religious beliefs which renders understanding between the natives and the British difficult. The author does not consider these objections as being altogether valid.

The section is concluded by a separate chapter on The Union of South Africa. Little hope is held out for the saving of South Africa for the white man unless drastic measures are taken. The first requisite would be the national determination to replace practically all black labor by white labor. The author seems dubious as to whether this can be brought about.

The last section of the book is devoted to a discussion of the population problems of Europe—Italy, central Europe, and a chapter on Great Britain. At present the author believes that the problem of Italy is more urgent than that of any other European country and is the one most likely to lead to fateful issues in the near future if some reasonable solution is not found for it. South America will undoubtedly take care of a large number of immigrants but not in sufficient numbers to relieve the pressure at home. The author feels that the mandates for Syria and Mesopotamia should be transferred by France and Great Britain to Italy. With a birth rate which is falling, Italy with increased lands will control her population growth.

In Germany the population has been approaching a stationary state since the war. A small emigration to the United States and South America, together with efficiency in industry and an expanding trade seems sufficient to provide for standards held by the German people.

The non German peoples of Central Europe are next considered. The author believes that Czechoslovakia soon will be in a position comparable to Germany with reference to its birth rate. Poland in 30 or 40 years will be ''pushing over the brink'' unless Poles are allowed to emigrate into Asiatic Russia. Rumania can take care of her increase for the next 20 or 30 years and it may be possible that the nation will provide support for her increased population through industrialization. The author believes that in the Balkans population pressure can scarcely be regarded as the major factor likely to create disturbance there. A segregation of racial groups such as has occurred in Greece and Turkey is recommended in the Balkans.

The population problem of Great Britain is discussed in one chapter which is anything but cheerful. Quotations from the author best convey his opinions as to the

future of the island's inhabitants. "Coal is becoming steadily dearer . . . the actual production per person is now only about two-thirds of what it was in 1880. . . . Great Britain is also unfortunate in that its iron ore is steadily falling off in quality. . . . In almost all lines of manufacturing there is now some competition which possesses conditons as advantageous for cheap production as Great Britain or even more so. . . . There is still another element in this situation which merits our careful attention. It is the increasing extent to which the nations of the world are becoming self-sufficing in their manufactured goods." As a result of these and other reasons, the author believes Great Britain is overpopulated and he sees "no reasonable basis for the belief that in a few years with careful planning Great Britain will take up the slack of unemployment and be able to support its present population and its increase at improving standards of living."

Although emigration might solve the population problem, the British are not emigrating because they are not in the first place adapted to many types of work and secondly they are not always welcome in their own dominions in many lines of endeavor.

To sum up, the author says, "It appears that there is no clear way out of the present situation." He believes that the burden of unemployment will be present until birth control cuts down the numbers of its people to those that can find profitable work in its agriculture and industry.

The last chapter of the book is a résumé of this most stimulating and at the same time disturbing book. The author finally states that birth control is the only remedy for overcrowding, although emigration is an extremely effective way both of spreading the practice of birth control directly and of producing those conditions in which birth control thrives. For the next few decades the author believes that emigration from congested areas must occur or war will result.

The book is written in simple language and the raw material has unquestionably been partly interpreted by the extensive travels of the author. From the reviewer's standpoint it is unfortunate that the problem of the Slav population in Soviet Russia itself is not considered. There are doubts in the reviewer's mind as to whether European and Asiatic Russia can care for the great increase in the population of that country over the next few decades.

There are some passages in the book which suggest to the reviewer that the rising nations are those with rapidly increasing populations and that those with a stationary population are in the decline. This is not the case and the reviewer feels sure that this is not the opinion of the author.

The book should be read by those interested in international relations and particularly by those who are concerned in seeing the peace of the world maintained on a scientific and commonsense basis. The author himself would undoubtedly agree that the more or less specific transfers of territory might be brought about in a different fashion than suggested. One must admire the author for his frankness and his facing of the facts. We need more books of this nature.

Edwin C. Voorhies

University of California

Population Problems by Warren S. Thompson. New York: McGraw-Hill Book Company Inc. 1930. 462 pp. $3.75.

The author opens his discussion by a careful treatment of the nature of the problem and an explanation of its importance.

Increased interest in population problems arises because of the unprecedented in-

crease in numbers of people during the past century, the belief in our power to cooperate with the forces of nature to attain our desired ends, increasing knowledge of our resources, their scarcity and abundance and their relation to trends in the population growth, political and economic problems arising because of wide differences in the composition of the population of different countries, and finally the rapid growth of urban industrial populations.

Population policies are classified as restrictive, expansive and eugenic. Restrictive policies have received more attention than have the others. Populations have been and are being restricted by infanticide, abortion, sexual taboos, abandonment or actually killing of the sick and aged, passive acceptance of recurring catastrophies, legal restrictions upon marriage, migration, contraceptive measures and to some extent where war has been a part of the everyday life of a tribe or nation it may be considered as a policy restricting population growth.

Expansive policies have for the most part been unsuccessful except where accompanied by economic conditions favorable to population expansion. Expansion of populations has been encouraged by rulers or dynasties desiring large numbers for military strength, by religious motives which have to some extent tended to offset the restrictive measures already mentioned and by imperialistic tendencies arising when a whole tribe or state becomes "imbued with the idea of expanding over a given area and of forcing its power upon the people already settled there." Most important of all the forces operating to bring about expansion of peoples is economic opportunity, which rather than national expediency, must be the cornerstone of a rational population policy if it is to be effective.

Eugenic considerations have not been important in the determination of policies. Elimination of the malformed and the mentally deficient has not been so effective as formerly but it is doubtful if these reproduce to any great extent.

Thompson divides into two groups the doctrines of philosophers who have attempted to develop theories of population, the *natural* and the *social*. The first of these includes the theories of Spencer and of Doubleday and chief of all the Malthusian doctrine, while as examples of the second the theories of Marx and George have been selected. Gini he credits with having contributed something both of the natural and of the social. The essays of Malthus are given special consideration and in such a careful, thorough and fair manner that the writer of those classics, if he were living today, could not object to the interpretations made. Giving Malthus a place of honor which he "richly deserves," crediting him with having "set the style in population theory," declaring that all modern study of population should begin with his essays, the author turns his back on further search of a single natural law of population growth and proceeds "on the assumption that there is no law of population growth, but rather that the conditions of life, both physical and social, determine this growth, and that it varies from group to group as these conditions vary." The Industrial Revolution and the accompanying improvement in sanitation removed the two positive checks to population growth and as Malthus had predicted a phenomenal growth in population followed. But the new social and economic conditions ushered in by the Industrial Revolution introduced a new preventive check not given consideration by Malthus. Contraception, the author states, "bids fair to upset Malthus' prediction of future hardship for those people among whom it becomes a matter of common practice."

Social and economic problems of any community and the composition of the population are so inter-related that an understanding of one necessitates a knowledge of the other. Sex composition affects the death rate and the status of women in general.

Age composition may determine the attitude of a population on matters of policy, business or religion. A community in which there is a large percentage of men and women in the prime of life will have a higher per capita productive power. Occupational differences of communities are accompanied by differences in birth and death rates and in popular interests, and these in turn are reflected in the social and economic structure. In like manner the occupational, the Rural-Urban, the Nationality, and the Religious compositions each have their influence upon the life and business of any group. It is obvious that any one of these cannot have an effect upon the group independent of the others. They must be treated therefore in the light of their interdependence if we expect to understand the social and economic differences between communities.

One of the more striking characteristics of the birth rates of most European nations is the downward trend. Still more striking is the fact that in most of the European countries this rate of decline is proportionally the same. Contrary to the statements of previous writers the author discredits the view that there was a turning point in the trend of the birth rate in 1875. Accuracy of compiling data has gradually been improved and when corrections are made for the errors made in the earlier records there is no occasion for believing that this date marks the change from an increasing to a decreasing birth rate. Outstanding differences in the compositions of different populations emphasize the need for refinements in the calculation of birth rates. Accordingly, the crude birth rate must be replaced, for many comparisons, by specific birth rates; i.e., birth rates of women of specific ages, nationality, occupation, etc., for the different groups in the population. "It is particularly important to note how two female populations differ from one another in the group aged twenty to twenty-nine, for it is during this 10-year period that most women bear a large proportion of their children." For comparison of birth rates in populations having different marriage customs the nuptial birth rate; i.e., the number of births per thousand married women is also important.

Birth rates among the different occupational groups vary widely and these differential rates are reflected in differences in the birth rates of communities, regions and countries. So pronounced are these differences that the populations of the "clean handed" or "white collared" professions are producing a small percentage of the population increase. Commenting on the future trend of the birth rates of the occupational groups, the author hazards the guess that "the poorer paid types of workers will cut their birth rates even more rapidly than will the better paid types. . . . "Farmers," he states, "will probably continue to furnish a very large part of such natural increases as may take place." He offers no pessimistic prediction of the social consequences of the differential birth rate.

In the United States personal ambition, and in European countries the maintenance of the present status of life, seem to be the most powerful influences controlling the birth rate. Basic differences between life in city and country are responsible for the differential birth rate between Urban and Rural populations. These include differences in the extent to which children hinder the attainment of personal ambitions, the relative opportunities for employment and care of children, the occupations of mothers, differences in ages at marriage, time required to perfect one's self for urban employment, and the spread of knowledge of contraceptives. It seems that a clearer statement might have been made of the relation between differential fertility and the decline in the birth rate. To be sure he has stated in no uncertain terms that the differential rates due to unequal knowledge concerning the use of contraceptives will soon disappear but that there will still remain class differentials. The reader must rely upon statements concerning the trend in the

population composition together with the birth rates in the different groups to understand the full importance of this relationship. The author's treatment of the factors in the decline of the birth rate are purely qualitative.

The most important factor in the growth of population in the West since the latter part of the eighteenth or beginning of the nineteenth century has been the control of infant mortality. Decline in infant mortality has been largely responsible for the declining death rates. Much of the difference in crude death rates in different countries may be attributed to differences in child mortality. Improvement in the death rate between 1900 and 1926 by the campaigns against tuberculosis accounted for 1.1 of the total of 5.5 gain per 1,000. Improvement in mortality of infants and children under 5 accounted for a gain of nearly twice that amount. Gains in the mortality rate from smallpox might have been as great as those from tuberculosis but little progress has been made with respect to other causes of adult deaths. In fact per capita deaths from heart disease, cancer, and respiratory diseases other than tuberculosis, are on the increase. The conclusion is that in low birth rate countries the crude death rate will soon begin to rise because of the changing age composition of the population. The limits within which further reduction in infant mortality is possible are significant with respect to future estimates of trends in population growth.

The death rate is materially different for populations of different composition. It has been stated that sex ratio is important in the comparison of death rates. Differences in age composition also are important because of differences in mortality from this cause alone. Different occupational groups have death rates peculiar to each group. To a large extent this is due to the economic status of the particular occupational group. There are, however, certain risks attached to some of the professions which increase the hazard. The most important cause of differences in death rates is the difference in economic status which explains to a large extent not only differences in occupational groups but in nationality groups as well.

Problems of population growth among negroes are not essentially different than for whites. Where the negro population constitutes an appreciable percentage, however, mortality and birth rates may be affected thereby and the two groups should be considered separately. Economic status accounts for the higher mortality rates among negroes. The author predicts a darker rather than a lighter skinned negro for the future. Statistics which would throw light on the trend of the proportion of the negro to the white population are lacking, but the author hazards the opinion that "they will become a diminishing part of our total population." Social problems of the negro and important differences in birth and death rates accompany differences in age distribution in different parts of the country.

Epidemics and starvation have played an important rôle in the past and in a large part of the world today are effective in the regulation of population growth. The effectiveness of these checks in the immediate future will depend upon "the rapidity with which backward countries develop their transport, effect adequate relief organization, and accumulate a surplus of wealth available in exchange for food in case of need. In speaking of the more distant future the author states that "too dense a population must necessarily be thinned from time to time by hunger. There is no alternative."

Natural increase the author defines as the difference between birth rates and death rates. Later he uses the term in a manner that clearly takes into consideration immigration and emigration. With the exception of France where natural increase had been on the decline for many decades, the countries of western Europe have had trends in natural increase. The rates increased throughout the second

and third quarters of the 19th century. During the last quarter it declined slowly until the World War after which it has been declining very rapidly. The increasing rates of natural increase were largely due to the improvement in mortality rates while the decrease was the declining birth rates which followed and which the author attributes to the increased practice of birth control which in turn was the result of the industrial revolution and the accompanying increase in personal ambition. In the United States, Australia, Canada and South Africa, a similar situation seems to prevail. On the other hand in the countries of eastern and southern Europe and in Japan, India, and Asia natural increase has an entirely different trend and in most of these countries there will probably be a rapidly increasing population growth in the next few decades because of the probability that mortality rates will be improved before contraception will have advanced to a point sufficient to offset the improvement in death rate. In these countries also there is already pressure of population against food supply, while in the possessions of the countries of western Europe and certain other countries the agricultural land area is in excess of present and probable future needs. Herein the author sees the seeds of conflict arising from a sense of injustice inflicted by the countries having abundant land resources against those countries already badly in need of expanding room. The recommendation is that England and France allow Japan and Italy to colonize in certain of their tropical possessions. The outlook for an amicable solution is none too optimistic.

Three chapters are devoted to the growth and characteristics of the modern city. The direct relation of these chapters to the general theme of the book is none too clearly portrayed but it is not difficult for the reader to fill in the needed transitional ideas to justify their inclusion. There is no question that the Urban development has had an important influence upon the quantity and quality of our population.

The author clearly states his position in the matter of eugenics. Aside from restricting the reproduction of clear cut cases of feeble mindedness and insanity he would limit such control to placing contraceptives and a knowledge of their use in the hands of those whose members should be limited. A decision as to the criterion of the latter, however, is most difficult. To promote the growth of numbers in special cases where that may be found desirable he would subsidize motherhood. Possibly the author himself would object to the use of the word "subsidize" for he prefers to call it "compensation" for a recognized vocation.

On the whole, the book is well written and is supported by an abundance of statistics and general facts. At times, however, the philosophical discussions rely entirely upon the qualitative reasoning of the author thus leaving the reader ample room for the formulation of contrary opinions. The book is far superior to recent publications on the same subject which refrain from venturing an opinion as to the future trend. In fact there seems to be just a little too much certainty in the statements made regarding some of the rather intangible factors. Among these may be mentioned the trend in the birth rate. The scholarly work of Daublin and Lotka on the "true rate of natural increase" which the author incorporates as a vital part of his treatise probably places too much emphasis upon fertility rates of the immediate present and the recent past which are probably more sharply downward than the secular trend, which in itself is undoubtedly downward, will prove to be. Data needed for determining specific fertility rates have been available only for a short period. Trends can be studied only by the use of data obscured by the complexities of population composition which the author states are so important. There is reason to believe that there are cyclical variations in specific

fertility rates and that recent investigations have been influenced by a downward phase of this variation and by an abnormal age distribution of the female population in the ages of maximum fecundity, although the methods now used are supposed to eliminate the effect of the latter.

Over emphasis of efficiency in agriculture is probably a common error being made by a number of economists at the present time. The increased output of dairy products per unit of feed is truly a saving in land area but is accomplished by greater expenditures of labor and capital which to a large extent offset the savings in feed. Reduction in labor used in agriculture represents to a large extent the removal from the country of many activities formerly carried on there. There have undoubtedly been great efficiencies but we have not been so far from the influence of diminishing returns in this country as might be inferred from reading the chapter in this book on "Population Growth and Agriculture."

One of the greatest contributions of the book is the discussion of the optimum population. In this, the "dyed in the wool" economist will learn that there are human aspirations and spiritual qualities to be attained beyond the mere accumulation of wealth, and that they must be taken into consideration in the formulation of a sound population policy.

David Weeks

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Environmental Basis of Social Geography, by Huntington and Carlson. New York: Prentice-Hall, Inc. 1930. 499 pp. $4.00.

Three problems face the author of a textbook in elementary geography:

1. What is the primary purpose of a course in the elements of geography?
2. What subject-matter can best be used in order to attain the goal to be reached in a course of this kind?
3. How can the subject-matter selected be systematized best in order to clearly present the facts necessary to develop in the student's mind a clear conception of the significance of this material?

No text yet published has been found entirely adequate for elementary courses in geography, but year by year with the improvement in presentation of subject-matter and the development of a clearer conception of the significance of the fundamentals of modern geography better texts make their appearance.

It would be idle to attempt an analysis of the book reviewed or even to consider its strong or weak points. One feels, however, in spite of the significance of the topics treated, that the presentation is too encyclopedic; likewise in spite of the importance of many of the major subjects included, the student is likely to look upon the whole too much as a compilation of facts rather than as material developed in a sequence calculated to imprint its major features upon the minds of those who may only pass by.

Although the book may not result in a full realization of the authors' hopes of giving to the students of the old subject of geography a new point of view, it does embody a wealth of material which, under skillful instruction, should in time contribute in no small degree to this larger objective. The book is highly informative and should go a long way toward pointing out more clearly the relationship between geography as here conceived and economics, especially land and agricultural economics.

F. A. Buechel

University of Texas

The Place of Agriculture in American Life by Wilson Gee. New York: The Macmillan Co. 1930. 215 pp. $2.00.

In this book the author does well the task assigned himself, namely: "To attempt within the pages of a small volume to present a comprehensive picture of American Agriculture, its contribution to our national life, its history, its present problems and its future possibilities—a book which will give to the lay reader, both urban and rural, a broad perceptive and as interestingly as possible that sort of picture which will create a more sympathetic understanding of the present plight of the American farmer as a basis for the improvement of his status, and a keener recognition of the importance of maintaining a sound rural life as a strong element of present and future security in our national structure."

Beginning with "The Contribution of the Countryside" the author in succeeding chapters passes in review "From Self Sufficiency to Commercial Agriculture"; "The Economic Condition of the Farmer"; "Some Rural Social Problems"; "The Farmer in Politics"; "Cooperation in Agriculture"; and, "Why Farm Relief"; with a final chapter entitled, "The Future of American Agriculture." Synthesis rather than analysis appears to have been the aim. No new discoveries or proposals are offered. It would seem, however, that perhaps the subjects of Agricultural Economics and Rural Sociology are reaching the stage where the synthetical method might be more frequently used. The book is easily read.

J. I. Falconer

Ohio State University

Chinese Farm Economy: A study of 2866 farms in 17 localities and 7 provinces in China, by John Lossing Buck, University of Nanking, Shanghai, and the China Council of the Institute of Pacific Relations. Chicago: University of Chicago Press. 1930. 476 pp. $5.00.

All students of Chinese affairs must feel grateful to Dr. Buck for having marshaled in one book such a wealth of quantitative material on Chinese agricultural economy. Combining into one analysis 17 different farm management surveys covering diverse conditions and different years was a difficult task, but Dr. Buck has encompassed it with surprising success. While Chinese literature is rich in descriptive and historical works on agriculture, it is sadly lacking in quantitative treatises. Professor Buck's book supplies a real need in this direction. Together with Professor King's masterful account (Farmers of Forty Centuries, N.Y.: Harcourt, Brace & Co., 1915, 379 pp.) and Dr. Wagner's encyclopedic treatment (Die Chinesische Landwirtschaft, Berlin: Paul Parey, 1926, 668 pp.) it will form the nucleus of a good library on the economic aspects of Chinese agriculture.

"Chinese Farm Economy" is an inductive study. Its data were collected by a farm-to-farm survey using a definite schedule much like those commonly used in farm business surveys in the United States, but with more social data and more data on family living. We agree with the author that the survey method is likely to prove the most practical and economical method at this stage of farm economic studies in China. The author has carried his statistical analysis somewhat farther than is commonly the case in the United States, employing even multiple correlation analysis. Whether the results so obtained are significant is not without question.

The discussion covers the main aspects of production and consumption on the Chinese farm. It treats of such topics as natural factors, farm layout, land utilization, the best size of farm business, tenancy, crops, livestock, maintenance of soil

fertility, farm labour, composition of the farm family and population, food consumption and standards of living. For each subject, the author has drawn his own conclusions, and has suggested ways of improvement.

The chief conclusion which one gathers from the book is that the small size of Chinese farm business, due to the over-supply of farm labour and lack of capital, has resulted in a low standard of living. Control of population, development of natural resources, improved transportation, and better credit and marketing facilities, and the application of more scientific methods of agricultural technique, are suggested as appropriate remedies.

One may question whether the book represents a true picture of Chinese farm economy. First, the surveys in each area were for only one year, and farming conditions change from year to year in China as elsewhere. Secondly, one may properly inquire whether the author has covered all the major types of areas in China. The author frankly admits that the selection of the particular localities studied was determined by the circumstances of having available investigators native to the places. Advanced students of Dr. Buck took most of the records. Had some other provinces, such as the Three Eastern Provinces, Szechwan and Kansu, been studied, an entirely different picture of Chinese farm economy might have resulted. We agree with the author that "China is a land about which it is peculiarly difficult to generalize." Therefore the book at best can be considered only as presenting case studies of Chinese farm economy and not as "Chinese Farm Economy" as the title suggests.

Thirdly and most important of all, the samples are not representative of the particular localities studied. Nowhere in the book does one find a discussion of the sampling problem involved, and of the representativeness and accuracy of the data analyzed. There are, to be sure, a few remarks to the effect that "the particular farms studied were determined by blood relationship or friendship of the investigator to the operator, or by introduction of the investigator to the operator by friends or relatives"; but these suggest that no attention was given to the matter of sampling. The author states that "the errors attendant upon the survey method are relatively small, provided the sample is representative, bias is eliminated or accounted for, and provided the number of records is large enough." In Table 2 "Sources of data by villages" (on p. 6), for more than half of the cases studied no information is given as to the size or number of families of the villages from which samples have been chosen. Without such information, how can we tell that the sample is large enough for the purpose? Off hand, one would think that samples consisting of 2, 3, 4, 5, 6, 7, 10, or 14 families are entirely too small.

Because the book will no doubt be taken as a guide for similar studies in China in the near future, one debatable feature in the mode of analysis should be mentioned. This is the soundness of the method of not charging the use of the farm house by the family as a receipt in the analysis of the year's business, and yet in a later chapter devoted to farm living, estimating one-half of the farm buildings as residence, with a rental value of $11.32 per household (p. 400). To be consistent, if part of the farm buildings have been counted as for family use in the standard-of-living part of the analysis, they should not elsewhere be included as an expenditure of the farm business. In other words, the use of the house by the family should be counted as a receipt just as the use of crops for family consumption. If it is calculated in this way, the "labour earnings" will show an increase, especially in places where houses are of brick and the capitalization of the buildings has been heavy. Theoretically, there is no more reason why the farmer's dwelling house should be counted a part of the farming business than the storekeeper's living apart-

ment as a part of his merchandising business. The exclusion of house-rent from the non-cash receipts has lowered "labour earnings," and has made Chinese farm business to appear worse than it actually is. Rightly, Dr. Buck has used the "operators' labour earnings" rather than the "labour income" method of measuring farm returns.

A. Kaiming Chiu

Institute of Social Research
Peiping, China

Food Supply and Raw Materials in Japan. An Index of the Physical Volume of Production of Foodstuffs, Industrial Crops and Minerals, 1894-1927 by E. F. Penrose. Chicago: University of Chicago Press, 1929. 75 pp. $2.00.

This is a small volume, consisting mostly of statistical tables compiled for the Kyoto Conference of the Institute of Pacific Relations, which met in October, 1929. The data are derived from official records and the work has been done in a careful manner. The statement is made in the introduction that,—"In the fields covered it contains the most extensive collection of figures of production to be found in any one book in any language." In the reviewer's opinion this is correct, considering any nation as a whole. Figures are provided on the annual production of 30 varieties of fish from 1894 to 1927; on nine cereal crops, potatoes, beans and tea for the same period; on meat, milk and ten fruits from 1905 to 1927, except that citrus figures begin in 1909; on eggs for 1906 to 1927; and on 18 vegetables from 1909 to 1927. Each table provides data on physical quantities and derived index numbers, based on the period 1921-1925; also a weighted geometric total index for each group of products. Three other tables provide a total index for those foods—(1) for which figures are available back to 1894, (2) for which figures are available back to 1905, and (3) for which figures are available back to 1909, inclusive.

Chapter V is devoted to the gross imports of food, in which data are given on imports from foreign countries for 14 food products from 1902 to 1926, inclusive; on four food products from Korea from 1910 to 1927, inclusive; and on six products from Formosa from 1907 to 1927, inclusive.

Chapter VI is entitled "The Agricultural Indexes" and contains tables on production of silk cocoons from 1894 to 1925, inclusive; and for 12 industrial crops from 1905 to 1927, inclusive. Total agricultural production is then compared with food and population from 1907 to 1927 in three tables. Happily, the amount of cereals and other included products eaten by livestock in Japan is so small that the index is not seriously affected by the failure to subtract the crop feed eaten by the animals when animal products are added to crop production.

The tables are accompanied by seven graphs—(1) Cereals (4 curves), 1894-1927, (2) Potatoes and Beans, 1894-1927, (3) Population and Food Index, 1894-1927, (4) Animal Foodstuffs (4 curves), 1894-1927, (5) Food, Agriculture and Population, 1907-1927, (6) Imports of Food, 1902-1926 or 1927, (7) Total Imports of Food and Population, 1910-1926 or 1927. At the close of the book are two additional graphs, —one showing the percentage increase since 1910 in home production of food and of imported food, and the other showing trends of home production of food with and without imports added. The increasing dependence of the Japanese people upon imports of food is very evident.

One graph indicates that from 1923 to 1927 the production of industrial crops was increasing more rapidly than food crops, and this trend may have continued since 1927. Another graph shows that from 1894 to 1905 food production increased only

a little, whereas population increased about 15 per cent. From 1905 to 1920 food production increased more rapidly than population. During the five-year period centered on 1918 food production was about 50 per cent greater than in 1894, the base year, whereas population was only about 36 per cent greater. But since 1916 the trend of food production has been about stationary and in 1924-1927 the ratio to population (production per capita) was about the same as 30 years earlier.

The production of animal foodstuffs, mostly fish, increased about three-fold during these 30 years. Between 1910 and 1926 imports of food increased four-fold. The standard of living, at least in food, was rising until 1920, and production of animal products increased more rapidly than population until 1925. As the data are given only to and including 1927, it is not known what the trend has been since 1925.

Chapter VII contains data on production of seven minerals since 1877, of iron pyrites since 1891, of lignite since 1901, and of zinc since 1914. Production of the minerals was almost nothing in 1877, reached a peak between 1915 and 1920, except that production of coal was higher in 1925 and of gold and iron pyrites in 1926 than in any previous year.

Chapter VIII is entitled "Conclusion" and contains these statements:

"The tables and charts for cereals, after registering marked rises in the pre-war and war periods (omitting barley for the moment) have shown since 1920 what may perhaps be best described as a halting tendency. This is highly important. Cereals play an extraordinarily large part in agriculture and food and the welfare of the agricultural classes is intimately bound up with the conditions of production and prices in the cereal market.

"In the case of barley we may speak of a receding rather than a halting tendency.

"Beans show a fairly stationary condition since 1901, except for the two years 1920-1921. Since 1921 they have tended to decline. Potatoes show a receding tendency since 1919; only in two years since then has production exceeded the amount reached in the preceding year.

"The above tendencies derive added significance from the widespread unrest among the agricultural classes in Japan in recent years. They justify the intense interest in food, agricultural, and population questions which is evident on all hands in Japan today. They justify the appointment of the Government Commission of Enquiry into the Food and Population Problems. . . .

"The conclusion is tentatively suggested here that Japan is probably destined to pass through the same stage in the twentieth century that England passed through in the nineteenth, and that she will, as the century goes on, become dependent on imports for a considerable portion of her food supply. . . .

"Japan cannot afford protectionist tariffs. In the United States, with its vast natural resources and extensive land area, protection cannot prevent a considerable rise in the standard of living. But Japan is a relatively tiny area as compared with the United States, and yet within its borders a population a little over one-half that of the United States struggles to eke out a living. In food and housing the standard of living in Japan is very markedly inferior to that in Western countries. What is needed is not that Japan should just maintain its present standard, or slowly increase it by very small increments, but that a very substantial advance should be made. Having regard to the extent of the natural resources and land area within its borders no argument is required to show that this cannot be effected by a self-contained economy, but presupposes extensive participation in world exchange of commodities. The more such participation is restricted by protectionist tariffs, the more difficult it will be to increase physical production and the national income and to raise the standard of living. The existing measures of protection, bolstered up by

vested interests and supported by crudely fallacious arguments, constitute a national danger to Japan, the removal of which should be a foremost object of intelligent opinion."

An Appendix contains notes on iron ore in the mineral index, "A Note on the Future of the Japanese Birth Rate," mathematical explanations of the calculation of trend lines and of the means of combining the home food production and food import indexes.

If such a compilation and graphic presentation of statistics were available for the other leading nations of the world, it would be an easy matter not only to compare production per person engaged in agriculture and consumption per capita in these nations, but also to see in what direction the agriculture and the diet in each nation was trending. It is to be hoped that this book will encourage statisticians in other nations to "go and do likewise" wherever the data are available.

O. E. Baker

Bureau of Agricultural Economics

Tax Racket and Tax Reform by Herbert D. Simpson. Chicago: The Institute for Economic Research, 1930. 263 pp. $2.50.

Lurid in binding and luring in title this book describes and analyzes that Chicago tax situation which has captured the attention of the world. Written as a result of four years of first-hand study of this situation, it has that grasp of fact and that flavor of intimacy so essential to accurate portrayal of a complicated social problem.

The treatment is in three divisions: tax racket; tax relief; and tax remedy.

It is based on an examination of 6445 real property transfers made in a period of eight months midway between the 1923 and the 1927 quadrennial assessments of real estate. Various tests established this group as a representative sample. Assessments on these properties were traced from the 1923 assessment of the Board of Assessors through the reassessment made under order of the State Tax Commission in 1928.

The section on the tax racket subjects this racket to the cold test of statistical analysis and the results so obtained amply justify the color in the title of the book. The assessment of individual properties made in 1923 was shown to vary from a fraction of 1 per cent of sale value to more than 100 per cent. The average deviation from the level of uniform assessment was 40 per cent. Assessments by townships ranged from 8.7 per cent of sale value to 55.0 per cent. Assessments by classes of property ranged from 19.7 per cent of sale value for vacant lots to 59.9 per cent for office and bank buildings. Four years of adjustments by the Board of Assessors and by the Board of Review reduced the average deviation from the level of uniform assessment only from 40 per cent to 38 per cent. The wide range of inequality among individual properties, townships, districts and classes of property remained. The 1927 assessment in general continued the inequalities of the 1923 assessment with one conspicious exception, an upward revision in the assessment of vacant lots. Corrections by the Board of Review did not eliminate variations in assessment. With the properties classified by value the adjustments of this board actually increased these variations.

Professor Simpson places responsibility for this state of affairs immediately upon the Board of Assessors and the Board of Review and ultimately upon certain legal, economic and social engredients in the Chicago tax situation. The evil effects of decentralized and overlapping jurisdictions, of decentralized assessment administration, of vested right—so called in Chicago—to assessment positions, of vested equities

in inequitable assessments, and of the fear which the victims have of retaliation at the hands of assessing officials are made clear.

The last chapter in the division on the tax racket traces the movement of protest in which teachers' organizations, certain downtown property groups and eventually the Joint Commission on Real Estate Valuation, the Illinois Agricultural Association, and the State Tax Commission took part. The strategy of this movement consisted in getting the facts of assessment as assembled by Professor Simpson and his associates before the people.

The division on tax relief analyzes the results of the reassessment ordered by the State Tax Commission and describes the financial crisis which followed. Persons who believe it possible to improve the assessment of real property will be interested in the progress made by the reassessing body. By every test a striking improvement in assessment was made. The deviation from uniformity became 20 per cent. In 1923 it was 40 per cent and in 1927, 37 per cent. Comparisons by townships, districts, classes of property, and values of property all registered notable gains.

The last division, that on tax remedy, is concerned with permanent rather than first aid measures of relief. Professor Simpson recommends a thoroughgoing reorganization of the government of Chicago and Cook County. He would have consolidation of "overlapping and conflicting jurisdictions," enlarged powers of home-rule, a genuine budgetary system of finance, and a centralized assessment administration. Also he recognized that no ultimate solution of Chicago's tax difficulties will be reached without cooperation with the remainder of the state in solving tax problems of general concern.

On closing this book the reviewer wished that there were more of it. Although Professor Simpson has a gift of clear expression, nevertheless it seemed to the reviewer that some of his chapters were too compressed. Aside from this "good" fault, so rarely found, there is but little in the way of adverse criticism to be said. In the reviewer's judgment this book is a valuable and instructive study. It is his prediction that it will find a high place in that youthful and growing body of tax literature in which actual tax situations are described and analyzed.

M. Slade Kendrick

Cornell University

Methods of Correlation Analysis by Mordecai Ezekiel. New York: John Wiley and Sons. 1930. xiv, 427 pp. $4.50.

Statistical workers in Economics, and especially in Agricultural Economics, will expect much of a book on methods of correlation analysis by Dr. Ezekiel. In this book they will be likely to find even more than expected. It combines to an unusual degree the qualifications for a handbook for practicing statisticians, a text for class use, and a non-technical exposition of the general scientific problem of drawing conclusions regarding relationships between measured phenomena. The latter feature of the work will render the book useful to many scientific workers, and others interested in scientific method, who do not regard themselves as statisticians nor feel any need for studying the details of statistical technique.

Chapters 1 to 7 comprise an excellent exposition of the general problem of measuring relationships between phenomena in simple cases, and of the nature and importance of the errors that may result in drawing general conclusions from a limited number of observations, even when there is reason to regard the observations as representative. Chapter 9 explains in simple terms the meaning of the coefficient of correlation and of other useful constants that may be derived from correlation analysis. A good idea of

the conditions under which multiple correlation analysis is called for and of the meaning of multiple correlation results may be obtained from a perusal of pp. 139-163 (Chapters 10 and 11 and part of Chapter 12) and pp. 229-41 (Chapter 16). Chapter 20 contributes further to clarifying the meaning of multiple correlation results, and in particular shows clearly how inadequate a statement even curvilinear multiple correlation analysis may give of the true relation between one variable and two others related to it "jointly." The chapter suggests methods which may permit adequate treatment of such joint relationships. Chapter 22, giving illustrations of a variety of problems to which correlation analysis has been applied, and Chapter 19, dealing with the effects of observational errors and of selection in obtaining data, will be interesting to many.

For intelligent and easy reading of the above-mentioned discussions, virtually no knowledge of either mathematics or of the details of statistical methods is required. The presentation is for the most part lucid and interesting. At certain points in these chapters details of technique are discussed (usually in footnotes) but the treatment is such that technical details may be passed over almost entirely without seriously affecting the clarity of the presentation.

For the practicing statistician, some illumination on the meaning of various statistical methods may be found in the chapters mentioned above—how much illumination, will depend on the thoroughness of his previous understanding of the methods. The outstanding merits of the work, from his point of view, will appear to be the exposition of methods for making multiple correlation analysis using curvilinear relationships, and for taking account of joint multiple relationships; the improved methods of measuring statistical significance of results, especially when dealing with small samples (chiefly based on the recent work of "Student" and R. A. Fisher); the demonstrations of the usefulness of graphic methods of analysis; the outlines of simplified methods of computation; and a series of charts facilitating computation of sampling errors. Worthy of mention also is the convenient "list of important equations" (pp. 399-404) which brings together in one place 91 useful formulas discussed in the text. It is to be hoped that in a future edition the author will include with each equation a reference to the pages in the text on which it is discussed.

The foregoing comments suggest the merits of the work as a text. It is by far the most up-to-date and comprehensive work on correlation analysis now in print. It combines thorough technical treatment with continuous emphasis on correct interpretation, and is admirably adapted for use with students whose study of mathematics stopped with high school algebra. It will make possible for the first time in many institutions the offering of an adequate basic course in the correlation of economic statistics, and will be found useful in most institutions where such courses are already offered.

There is relatively little in the work that seems deserving of criticism. Both author and publishers are to be congratulated on the almost complete freedom from typographical errors.[1] For the mathematical statistician, much of the discussion could be greatly condensed and the work rendered more valuable by inclusion of proofs of formulas left unproved and / or by more specific references to the literature in which proofs are given. Condensation, however, would largely destroy the value of the work for the large group of potential readers not well versed in mathematical statistics, for whom it is largely intended. Proofs of formulas and references to original papers are more faithfully given than in most statistical works intended primarily for such readers.

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[1] The following may be noted for the convenience of the reader: p. 121, in the first equation, write S^2 instead of S; p. 224, line 6, read *required* instead of *described;* p. 254, first line of footnote, read *Harold* instead of *Howard.*

A conspicuous feature of the book is its emphasis on the usefulness of freehand trends and regression lines, drawn in by eye with the aid of appropriately chosen subaverages, and, for comparison, its emphasis on the limitations of mathematical curves fitted by more rigorous methods. This general position the present reviewer heartily supports. In its development, however, the author appears to do less than full justice to the mathematical curves. The discussion is likely to leave the impression (perhaps not intended) that frequently a relationship which is essentially simple cannot be expressed by any simple algebraic equation. Much space is devoted, very profitably, to demonstrating that the relationship between percentage of vitreous kernels in wheat and the protein content (in per cent) cannot be described adequately by any one of several simple equations,[1] although the relation appears essentially simple. As a substitute, a free-hand curve is fitted. It is apparently not realized that the free-hand curve fails to fit the data as well as they could be fitted by another very simple mathematical curve—a quadrant of an ellipse.

An excellent discussion is given of the advantage which an algebraic equation possesses over a free-hand curve when there exist theoretical reasons for expecting a particular form of relationship, but no attention is given to what is perhaps a greater advantage of the algebraic equation. In the absence of theoretical reasons for expecting any particular form of relationship, discovery that it can be described by a simple algebraic equation may contribute greatly to development of an adequate theory regarding the nature of the relation.

Failure to appreciate fully the merits of mathematical curves has led the author to give much less attention than would be appropriate in such a text to consideration of characteristics of different types of equations. The treatment of this subject (pp. 66-70) is not only very brief, but is occasionally inaccurate.[2] The careful student will find it profitable to consult other texts, such as Joseph Likka's *Graphical and Mechanical Computation* (pp. 120-64) for a more adequate treatment of types of curves and methods of fitting.

The discussion (pp. 47-49) of reliability of group averages is defective and leads to the calculation of errors which are probably larger than the true errors. Dispersion in each group with respect to the independent variable is assumed to represent errors of observation, whereas in fact it depends largely on the arbitrary choice of width of the group and may rest to only a negligible degree on errors of observation. Dispersion in each group with respect to the dependent variable is assumed to represent wholly fluctuations in the dependant variable with a constant value of the independent variable, whereas it probably arises in part from fluctuations in the independent variable. Both of these inaccuracies in the analysis tend toward overstatement of the probable error of the calculated relationship.

A notable merit of the book is its emphasis on the necessity of using Fisher's tests for significance of correlation coefficients instead of the usual test based on a calculated probable error. It is explained correctly that the necessity for using Fisher's tests arises from the fact that the sampling distribution of correlation coefficients is

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[1] One of these equations is wrongly stated: in Fig. 17 and Fig. 18 the equation $Y = aX^b$ should be written $Y = ab^x$.

[2] A cubic parabola does not necessarily have two points at which the slope changes sign (p. 70); it may have no such point. Equation *(c)*, p. 66, which may be written, $y = ax^b$, is not recognized as a general equation for hyperbolas with asymptotes at $y = 0$, $x = 0$ (when b is negative). The only equation described as that of an hyperbola is the special case, $y = a(x-c)^{-1}$ (the equivalent of Ezekiel's equation [*e*], p. 66), in which the value of b in the more general equation is restricted to $b = -1$, and the asymptotes are $y = 0$, $x = c$. Even these simple characteristics are inaccurately described (p. 70). The misleading statement (p. 90) that "As a matter of fact, sometimes it is found that two different types of equations may each give exactly the identical curve when figured out," rests solely on failure to recognize the identity of two algebraic forms of the same equation.

frequently highly skewed, but it is erroneously implied (p. 256) that the skewness arises chiefly when samples are small. The skewness, for simple and partial correlation coefficients, depends almost entirely on the size of the correlation in the universe,[3] being very great for high correlations and negligible for low correlations. The skewness of the sampling distribution of the multiple correlation coefficient is a complicated function of both the size of the correlation in the universe and the number of observations.

The most serious fault of the work, as it appears to the present reviewer, is the writing of a large proportion of the formulas employed in multiple correlation, in terms of "probable true" values of standard deviations and correlation coefficients. Observed values of standard deviations and of correlation coefficients commonly do not give precisely the best estimates of the standard deviations and of the correlations in the population from which the sample is drawn. For many purposes, however, it is more important to know the values observed in the sample than the "best estimates," by some particular formula, for the corresponding values in the population. This is so commonly the case that it is very doubtful whether any time is saved by adopting as routine practice the computation first of the "best estimates," and second, from them, of the observed values. Pedagogically, it is clearly better to follow the logical procedure of computing first the values observed in the sample and, from them, the best estimates of values in the population. This is the more to be recommended for students since the formulas for the observed values are the simpler and the more easily understood. Finally and most important, elevation to primary position of the formulas for the "probable true" correlation in the population appears unwise because those formulas rest on an uncertain mathematical basis and appear rather clearly to give only an approximation, of unknown accuracy, to the actual "best estimate" of the correlation in the population. Pending the development of better formulas, these approximations appear worthy of use in the rather limited class of cases in which estimates of "probable true" correlations are called for, but they should not be presented as though they were the basic formulas.

The work is marked on the whole by the use throughout of a system of notation that is consistent, simple, and unambiguous. The meanings of the symbols σ, S, and $\mathcal{S}$, however, are not adequately explained. To designate a standard deviation observed in a sample, σ, with appropriate subscripts, is used. To designate a standard deviation in a population, as estimated from a sample, $\overline{S}$ is used. To designate the *estimated* standard deviation of the sampling errors of a statistic, σ is always used, although the use of $\overline{S}$ might be expected. S (not $\overline{S}$) is once used clearly (equation 63, p. 221) to designate a standard deviation in a population—an actual, not an estimated standard deviation, but presumably not an observed standard deviation. In equation (20), p. 114, however, it seems necessary to suppose that S is intended to represent either a standard deviation observed in a sample, or a standard deviation in a population as estimated from a sample. The equation is not correct for either. Confusion may be avoided by substituting for equation (20) (pp. 114, 400):

$$\sigma^2_{y\cdot x} = \frac{\sum z^2}{n} \qquad \overline{S}^2_{y\cdot x} = \frac{\sum z^2}{n-2}$$

$$\sigma^2_{y\cdot f(x)} = \frac{\sum (z'')^2}{n} \qquad \overline{S}^2_{y\cdot f(x)} = \frac{\sum (z'')^2}{n-m}$$

[3] This assertion is predicated on Fisher's statement that a non-linear function of r (the inverse hyperbolic tangent) has an almost perfectly symmetrical sampling distribution, whatever the number of observations; the usual direct measures show the skewness of the sampling distribution of r to vary with both the size of r and with the number of observations.

The change will affect the calculation on p. 115 and also the equations, on p. 121, from which equations (23) and (24) are derived, but will not alter equations (23) and (24) themselves.

In the foregoing paragraphs, criticism has occupied much space. Lest the effect be misleading, it should be said that the points on which Dr. Ezekiel's book may fairly be criticized are few and unimportant in comparison with the points on which it is deserving of praise. A poor and unimportant work may be dismissed with brief and general criticism. Full and detailed criticism is called for only in the case of a work which is generally sound and an important contribution in its field. *Methods of Correlation Analysis* is both.

Holbrook Working

Food Research Institute
Stanford University

NEWS ITEMS

Problems relating to the extension of economics material will be handled by a new unit in the United States Department of Agriculture in which the Bureau of Agricultural Economics and the Office of Cooperative Extension Work will cooperate. The unit will assist the state extension services in formulating and carrying out economics extension programs, and will assist in disseminating to extension workers the information made available in the work of the Bureau of Agricultural Economics. H. M. Dixon is chairman of the unit. Eugene Merritt will assist the States in developing economic extension programs, especially as they relate to standards of living. A. E. Mercker, cooperatively employed with the states of Virginia, North Carolina, South Carolina, and Florida, will carry on early potato work. J. K. Wallace will cooperate in livestock grading and marketing activities. R. M. Cooper, cooperatively employed with the states of Virginia, North Carolina, South Carolina, Georgia, and Florida, will carry on marketing and outlook work with tobacco. Harry E. Drobish, cooperatively employed with the states of Idaho and Washington, will do marketing and outlook work with potatoes. D. W. Watkins will give special attention to the South. M. C. Bond, cooperatively employed with Cornell University, and C. R. Arnold, cooperatively employed with Ohio State University will help with marketing and farm management, and F. A. Merrill will assist in the preparation of materials.

The Social Science Research Council, following a recommendation of its Advisory Committee on Social and Economic Research in Agriculture, has secured funds to support graduate courses in these fields in Washington. The object of this undertaking is to make the rich resources of data and the large and specialized personnel to be found in various governmental and private agencies located in Washington more accessible to graduate students. It is not expected that any student will supply his needs for graduate training exclusively from this source, but that it will supplement the work of other graduate training institutions and make certain contributions which cannot be so readily secured in any other way.

This work is to be under the direction of a sub-committee of the Social Science Research Council, and the courses will be offered in the Graduate School of American University, located at 19th and F Streets N.W., Washington, D.C.

The members of the committee in charge are as follows:

John D. Black, Harvard University.

L. C. Gray, Principal Economist, Bureau of Agricultural Economics, U. S. Department of Agriculture.

Nils A. Olsen, Chief, Bureau of Agricultural Economics, U. S. Department of Agriculture.

H. C. M. Case, University of Illinois.

E. G. Nourse, Chairman, Director of the Institute of Economics of the Brookings Institution.

The courses offered are of graduate character. It is assumed that the student has already had foundation courses in economic principles and statistical method, and it is desirable that he have considerable familiarity with the subject matter in the field of his special interest. The instructors are recognized leaders in their respective lines of research. They are expected to give the student who is developing his own line of investigation an intensive review of the more recent methodological developments, hypotheses, and conclusions formulated in the Bureau of Agricultural Economics, or other research agencies in Washington.

The teaching staff for the second semester, February-June, 1931, includes—

L. C. Gray, Ph.D., Principal Economist in Charge, Division of Land Economics, Bureau of Agricultural Economics.

C. L. Holmes, Ph.D., Principal Economist in Charge, Division of Farm Management and Costs, Bureau of Agricultural Economics.

E. G. Nourse, Ph.D., Director of Institute of Economics and formerly Chief of the Agricultural Economics Section, Iowa Agricultural Experiment Station.

O. C. Stine, Ph.D., Principal Economist in Charge, Division of Historical and Statistical Research, Bureau of Agricultural Economics.

Norman Wall, M.A., Senior Agricultural Economist, Division of Agricultural Finance, Bureau of Agricultural Economics.

D. L. Wickens, M.A., Agricultural Economist, Division of Agricultural Finance, Bureau of Agricultural Economics.

The Advisory Committee on Social and Economic Research in Agriculture met in New York City on February 14 and 15 with the following members present: Professor John D. Black, Dr. Edmund de S. Brunner, Professor Frank H. Knight, Dr. Lewis C. Gray, Professor J. H. Kolb, Professor Dwight Sanderson, and Professor M. L. Wilson. Professor R. T. Crane is the representative of the Problems and Policy Committee on the Advisory Committee. He was unable to attend on account of illness. The subjects receiving special attention at this meeting of the committee were: a proposed project on Rural Social Work, a proposed project on Negro Rural Communities, report of the special sub-committee on training in mathematics for agricultural economists and rural sociologists, the graduate work in agricultural economics in Washington, the report of the committee on translations of foreign material in agricultural economics, the report of the committee on establishing records of current research in agricultural economics and rural sociology, and the project on Scope and Method of Research.

The 1931 meeting of the American Farm Economic Association will be at Washington, D.C. The usual group of allied associations will meet at the same time and place.

A comprehensive study of poultry and egg marketing conditions in the city of Boston has been initiated by the mayor of Boston in the appointment of the following committee of investigation: Dr. Frederick V. Waugh, Secretary of the New England Research Council, Chairman; Mr. L. C. Parsons of the New England Poultrymen, Secretary; Mr. John T. Scully of the Commercial, Industrial, and Publicity Bureau of the City of Boston, Dr. James Mullowney, Head of the Food Division of the Boston City Health Department, and Mr. Harold B. Rowe, Extension Specialist in Agricultural Economics. This committee will study conditions in the poultry and egg trade of Boston, examine the market facilities and machinery, and investigate reports of trade practices, such as racketeering with a view to making recommendations for improvement. These recommendations may take the form of suggested city ordinances, dealer organizations, changes in terminal facilities or other improvements.

World agricultural policies with a view to organizing agricultural production in different countries so as to equalize the supply with the demand for farm products will be considered at the Fifteenth International Congress of Agriculture at Prague, Czechoslovakia, June 5 to 8, this year. Ninety-two national agricultural associations from 27 countries will participate in this Congress to be held under the auspices of the International Commission of Agriculture. The Congresses are held every two years in different countries, under the auspices of the governments of the countries in which they are held. The program this year is separated into seven sections

entitled: agrarian policies and rural economy; agricultural education and extension; agricultural cooperation; vegetable production; animal production; agricultural industries, and "the rural woman."

The Agricultural Economics Branch of the Department of Agriculture, Ottawa, now publishes "The Economic Annalist" which reviews from month to month agricultural economic research and agricultural conditions in the Dominion.

The Rural Economics Branch of the Department of Agriculture, Quebec, has three research projects under way. First, a study of 250 dairy farms supplying milk to the Montreal market. Second, a dairy farm management survey in Megantic County. Third, accounting studies in the principal agricultural areas; 20-25 farms constitute a unit, and cost-of-production data will be obtained. In addition a study of potato production in eastern Quebec will be undertaken this year.

Graduate Students in Agricultural Economics at Canadian Universities are distributed as follows: University of Manitoba 6, University of Toronto 5, University of British Columbia 3, University of Saskatchewan 1.

The present enrollment of 22 graduate students in the Department of Agricultural Economics at Oklahoma A. and M. College is striking evidence of the interest in this field. The department was organized only seven years ago under the direction of Dr. J. T. Sanders.

During the eighth Annual Farm Business Short Course which was held at Purdue University February 16, 17, and 18, the Indiana Farm Management Association was formed. The object of this Association is the more profitable organization and operation of farms in Indiana. The membership consists of farm managers, farm owners, farm renters, and others interested in farm management. Constitution and by-laws have been adopted and officers elected. Annual meetings will be held during Agricultural Conference Week at Purdue University and special meetings will be called whenever it seems desirable.

The Institute of Social and Religious Research has announced that plans have been completed for a religious survey of the Southern Appalachian region, work to begin in April.

A comprehensive economic and social survey of the Southern Appalachian region is being planned by several cooperating agencies, including the Federal Bureau of Agricultural Economics, U. S. Forestry Service, U. S. Office of Education, State Experiment Stations, and Institute of Social and Religious Research.

The Southwestern Political and Social Science Association held its annual meeting in Oklahoma City April 3 and 4. This is the first meeting to be held in Oklahoma during the eleven years in which the organization has been in existence. The Association serves the social science groups in Arizona, Colorado, Kansas, New Mexico, Texas, Oklahoma, Missouri, Mississippi, Arkansas, and Louisiana.

Dr. R. A. Fisher, chief statistician of the Rothamsted Agricultural Experimental Station, Harpenden, England, will spend eight weeks in the United States during the coming summer. He will be in residence on the staff at the Iowa State College during the first half of the Summer Session, June 16 to July 24 and later will visit a number of colleges, universities and experiment stations throughout the country. In connection with Dr. Fisher's visit the Iowa State College announces a special group of Summer Session courses covering the theory of statistics and their practical ap-

plication in biology, economics, psychology, genetics, farm crops, and animal husbandry.

Through cooperative agreements looking toward the expansion of crop and livestock reporting in the respective states, the following changes in location of state offices of the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics have been made: Georgia, from Atlanta to Athens, D. L. Floyd, in charge; Maryland and Delaware, from Washington, D.C., to College Park, Maryland, Richard Ross, in charge; New Mexico, from Las Cruces to State College, Fred Daniels in charge.

The agricultural outlook conference at Washington, D.C., in January was attended by about 60 men from 39 states, besides those of the staff of the Department of Agriculture and the Federal Farm Board. Reports of the service units give an idea of the volume of work accomplished. The duplicating unit, Harry Panzer in charge, handled about 650 stencils during two weeks; two preliminary drafts involved 65,000 sheets in small runs for the conference, and the final report, 164 pages, amounted to 337,500 sheets for immediate distribution. The conference ended on Thursday evening; by Saturday afternoon 1,000 copies of the final report had been dispatched. The Graphics section, R. G. Hainsworth in charge, made 162 charts for use in outlook meetings, besides a large amount of work in the revision of charts previously made. The Photographic Laboratory, H. W. Wilcox in charge, made new bromides and solar negatives for the entire series of charts, and over 700 charts for use in the states. Besides the complete report, 91 printed pages, a 16-page edition in large type was printed.

The study of farmers' cooperative organizations in the northeastern states conducted last year by the Federal Farm Board has been extended to Virginia. Mr. R. C. Talbott, a graduate of Cornell University, has been engaged to make the survey and to tabulate the results. The chief purposes of the survey are to determine the present status of farmers' business organizations in Virginia and to gather and analyze facts which may be useful in developing still further sound principles of cooperative organization and management.

Representatives of the Foreign Agricultural Service located in foreign capitals have been designated by the State Department as Agricultural Attachés. Those thus promoted are E. A. Foley, at London; Loyd V. Steere, at Berlin; Louis G. Michael, at Belgrade, Yugo-Slavia; and Clifford C. Taylor, at Pretoria, South Africa.

Dr. O. E. Baker of the Division of Land Economics, Bureau of Agricultural Economics, has been requested to assist with the work of the President's Committee on Recent Social Changes, of which Dr. Wesley C. Mitchell of the National Bureau of Economic Research is chairman. With Dr. S. G. Tryon of the Bureau of Mines, Dr. Baker will prepare the portion of the report dealing with natural resources.

Professor Rollin H. Barrett of the Farm Management Department, Massachusetts Agricultural College, has reorganized the undergraduate course in farm records and accounts to place stress on records most useful in connection with farm budgeting and advance planning with the agricultural outlook rather than on cost determination.

Mr. Chris L. Christensen, Secretary of the Federal Farm Board since its organization in 1929, has resigned to become Dean of the College of Agriculture and Director of the Agricultural Experiment Station, University of Wisconsin.

Mr. Donald F. Christy has been appointed Assistant Agricultural Commissioner in Berlin, Germany, effective February 16, and sailed for his new station on February 18. Since 1925 Mr. Christy has been working on crop and livestock estimates, in Ohio, Wyoming, Colorado, and more recently in Washington, D.C., where he has been assisting with the historical revision of crop acreage, yields, and production.

Professor I. G. Davis of Connecticut Agricultural College has been appointed to membership on the committee on awards of fellowships in agricultural economics and rural sociology of the Social Science Research Council, to succeed Dr. J. S. Davis of the Federal Farm Board, who asked to be relieved because of pressure of Federal Farm Board duties.

Professor J. A. Dickey, Department of Rural Economics and Sociology, University of Arkansas, is on leave of absence during the spring semester to attend Cornell University.

Mr. William F. Droge, county extension agent, Rocky Ford, Colorado, has been appointed extension economist in farm management demonstrations in the Extension Service at the Colorado Agricultural College. Mr. Droge's new assignment will include the districts known as the Western Slope and Northwest Colorado.

Dr. Lynn Ramsey Edminster, for seven years an economist in the Institute of Economics, Brookings Institution, has been placed in charge of the work on foreign agricultural legislation in the Foreign Agricultural Service Division, Bureau of Agricultural Economics, with the rank of Principal Agricultural Economist. Prior to going to Brookings Institution, Dr. Edminster was for three years a member of the staff of the U. S. Tariff Commission, and for ten years he has been employed as part-time professor in the School of Foreign Service, Georgetown University. In 1926-27 he was Associate Professor of Commerce and Business Administration at the University of Virginia.

Dr. L. S. Ellis, who completed his doctorate at the University of Wisconsin last June, now has charge of the work in Agricultural Finance in the Department of Agricultural Economics at Oklahoma A. and M. College. Dr. Ellis is also editing "Current Farm Economics," the station outlook report.

Mr. L. M. Estabrook is now on leave from the U. S. Department of Agriculture and plans to spend some time resting at his farm in Frederick, Maryland, after several strenuous years of work on the World Census of Agriculture.

Miss Mary J. Foley, after a year's leave of absence because of ill health, has resumed her work as instructor in Agricultural Economics at Massachusetts Agricultural College.

Mr. L. P. Gabbard of Texas A. and M. College, has been elected Chairman, and R. H. Rogers of North Carolina State College, Secretary for the coming year, of the Agricultural Economics Section of the Association of Southern Agricultural Workers.

Mr. Edwin W. Gaumnitz has been appointed Senior Agricultural Economist in the Division of Dairy and Poultry Products, Bureau of Agricultural Economics with headquarters in New York City.

Dr. L. C. Gray, Division of Land Economics, Bureau of Agricultural Economics, has been invited to serve as a member of the Editorial Board of the "American Economic Review," the official publication of the American Economic Association.

Mr. Charles W. Harris, Jr., graduate of Massachusetts Agricultural College, 1930, has been added to the staff of the University of New Hampshire to conduct field work in efficiency studies in dairy farming in Crafton County, New Hampshire.

Mr. Omer W. Herrmann, associate professor of agricultural economics in charge of marketing at Oklahoma A. and M. College, has taken a year's leave of absence, beginning February 1, 1931. He has taken a position as Cotton Marketing Specialist with the Federal Farm Board in Washington, D.C.

Mr. E. L. Langsford has joined the staff of the Division of Farm Management and Costs, Bureau of Agricultural Economics, to work on farm management projects in the southern states east of the Mississippi River. Since receiving the master's degree at Iowa State College in 1928 Mr. Langsford has been connected with the Doane Agricultural Service assigned to managing properties in Mississippi.

Mr. Alex Legge relinquished his duties as Chairman of the Federal Farm Board on March 4, and has returned to the International Harvester Company.

Dr. E. G. Nourse has been appointed to membership on the Problems and Policy Committee of the Social Science Research Council. This is the first representation which agricultural economics has had on this committee of the Council.

Mr. Zach Savage, a graduate of the Alabama Polytechnic Institute, has been appointed Assistant Agricultural Economist at the Florida Agricultural Experiment Station, effective February 1, 1931.

Mr. E. D. Smith, formerly district agent in the extension service has been appointed extension economist in farm management demonstrations at the Colorado Agricultural College, and will give special attention to the development of work in agricultural economics, relating particularly to the problems of marketing.

Mr. James C. Stone, vice-chairman of the Federal Farm Board, was made chairman after the resignation of Mr. Legge.

Mr. Hugh W. Taylor of Kentucky, for many years tobacco and cotton specialist in Rhodesia, has been appointed Associate Marketing Specialist in the Tobacco Section, Bureau of Agricultural Economics, with headquarters in Washington, D.C. The duties assigned to Mr. Taylor include a new program of activity in laboratory work in the study of physical and chemical characteristics of tobacco grades, changes that take place in leaf tobacco during storage, methods of promoting better sorting practices by tobacco growers, and the introduction of standard grades as a basis for international trade in tobacco.

Mr. John L. Wann, formerly Assistant Agricultural Economist at the Florida Agricultural Experiment Station, transferred to the teaching division at the University of Florida on February 1, 1931, as Assistant Professor of Farm Management.

Miss Doris E. Washburn, a graduate of Mount Holyoke and Simmons Colleges, has been appointed Research Assistant in Farm Management, Massachusetts Agricultural College, beginning September 1931.

Dr. F. P. Weaver, Pennsylvania State College, was engaged for two months with the Agricultural Commission of the New Jersey State Legislature studying the marketing problem in Newark in an advisory capacity. Dr. Frank App was head of the sub-group of the Legislative Commission which did the work.

Professor M. L. Wilson of Montana Agricultural College, has been appointed a member of the Advisory Committee on Social and Economic Research in Agriculture to succeed Dr. E. G. Nourse who resigned to take a place on the Problems and Policy Committee of the Council.